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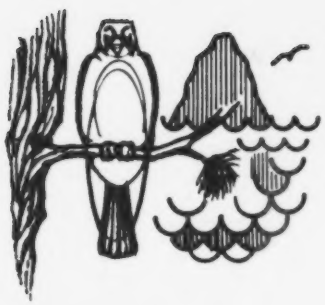

IMPORTANT FISH & WILDLIFE HABITATS OF Washington

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IMPORTANT FISH AND WILDLIFE HABITAT

OF

WASHINGTON

AN INVENTORY

U. S. Fish and Wildlife Service

Preface

Living things depend on each other and the habitats in which they exist. The whole is described as an ecosystem, a complete place of interdependence and coexistence. Removal of a single element from the ecosystem changes it, and its character can never be quite the same. Wildlife ecosystems are no exception.

Competition between elements of an ecosystem can promote its vigor or cause imbalance. Directly and indirectly, man has been a principal competitor. Often he has converted formerly undisturbed areas for other purposes, upsetting nature's balance.

Society has now begun to recognize the importance of preserving wildlife ecosystems. Opportunities for enjoyment of wildlife and wild places by all people, now and in the future, depend on how well they are protected. Guarding special ecosystems, with particular attention toward important fish and wildlife habitat, is explored in this plan.

ACKNOWLEDGMENTS

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Their input was critical to the completion of the preliminary identification process of candidate sites for areas of important fish and wildlife habitat in Washington.

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INTRODUCTION

IMPORTANT FISH AND WILDLIFE HABITATS

The U.S. Fish and Wildlife Service (FWS) has inventoried exceptional wildlife areas within each State and is making this information available, the intent being to encourage appropriate actions which will result in perpetuating these sites for their wildlife values. Identified sites are believed to qualify in one or both of the following categories.

Nationally Significant Wildlife Ecosystems: Areas which have fish and wildlife habitat values which go beyond local values in that they provide exceptional biological benefits to the collective resource base and are important to many people over a wide geographical area.

Important Wildlife Ecosystems: Habitats that are significantly different from other habitats in a region and support natural fish and wildlife communities.

Additionally, the following criteria are important:

1. Is the site imminently threatened?
2. Does it contribute to the maintenance of threatened, endangered or species of concern (Federal, State or local)?
3. Does it serve a wide diversity/concentration of wildlife species?
4. Is it different in relation to surrounding habitats?
5. Is it an outstanding example of a particular habitat type(s)?

Several methods can be utilized in preserving identified areas, and all--including combinations of actions--should be explored. Methods of preserving such wildlife ecosystems include the following possibilities:

1. Local and State comprehensive land use plans and zoning.
2. Control development through existing Federal regulations, such as Section 10 and Section 404 permit procedures, and floodplain/wetland Executive Orders.
3. Preservation by private conservation organizations or individuals.
4. Protection by other Federal, State or local government agencies.
5. Preservation through agreement, lease and/or easement by the FWS.

When all these avenues have been explored, and no other possibilities are presented, acquisition by the FWS may be considered. Sites acquired by the FWS would become units of the National Wildlife Refuge System.

This inventory, developed in cooperation with numerous organizations and individuals, will remain open-ended. New areas will be identified, existing sites may be lost, and relative importance may change, due to altered circumstances. Included is an initial listing of wildlife sites considered important in assuring the future welfare of native species.

Sites have been ranked according to information assembled and using criteria for measuring such factors as imminence of threat, presence of endangered species and uniqueness. The listing should be reviewed at least annually by interested individuals and representatives from various public and private organizations.

WASHINGTON STATE OVERVIEW

The area encompassed by the State of Washington is one with a rich diversity of climate and landform. Its approximately 66,600 square miles of land area include an extensive marine shoreline, mountains, valleys, plains, and large river systems. Wet, relatively mild marine climates occur in the western part of the state, while the eastern part is dominated by a dry continental climate with its extreme temperatures.

The Natural Environment

Washington contains a wide variety of ecosystems and habitats due largely to its diverse topography and climate. This diversity is reflected in the wide variety of physiographic provinces (Figure 1) and plant communities described below.

1. Olympic Peninsula. This province covers approximately six percent of Washington and includes the Olympic Mountains and the surrounding lowlands. Elevations range from sea level to over 7,000 feet in the glaciated peaks of the Olympics. Precipitation ranges from a low of 17 inches in the northeastern rain shadow to over 200 inches on the southwestern slopes. High precipitation and glaciation have resulted in a rugged topography of great relief. The area is generally characterized by dense forests with glaciated mountain peaks at the higher elevations. Predominant landowners are the National Park Service and the Forest Service.

2. Coast Range. Low mountains (Willapa Hills) ranging up to 3,000 feet and the coastal plain of southwestern Washington cover approximately four percent of the state and comprise this province. The area is densely forested, has low relief and receives 60-80 inches of precipitation over most of the area and up to 120 inches at higher elevations. Private ownership is predominate in this area.

3. Puget Trough. Extending the length of western Washington, this province includes the Puget Sound in the north and the Cowlitz and Chehalis River Basins in the south. Elevations range from sea level to 500 feet and precipitation is generally 40-60 inches per year. The area has little relief and is characterized by dense forests, extensive urban developments, and forested lands that have been cleared for agricultural purposes. The province covers approximately 10 percent of the state. The area is primarily in private ownership.

4. Northern Cascades. The province includes the Cascade Mountains from Snoqualmie Pass north to the Canadian border and covers about 14 percent of the state. Most of the Cascades range from 5,000-8,000 feet in elevation with a few that exceed 10,000 feet.

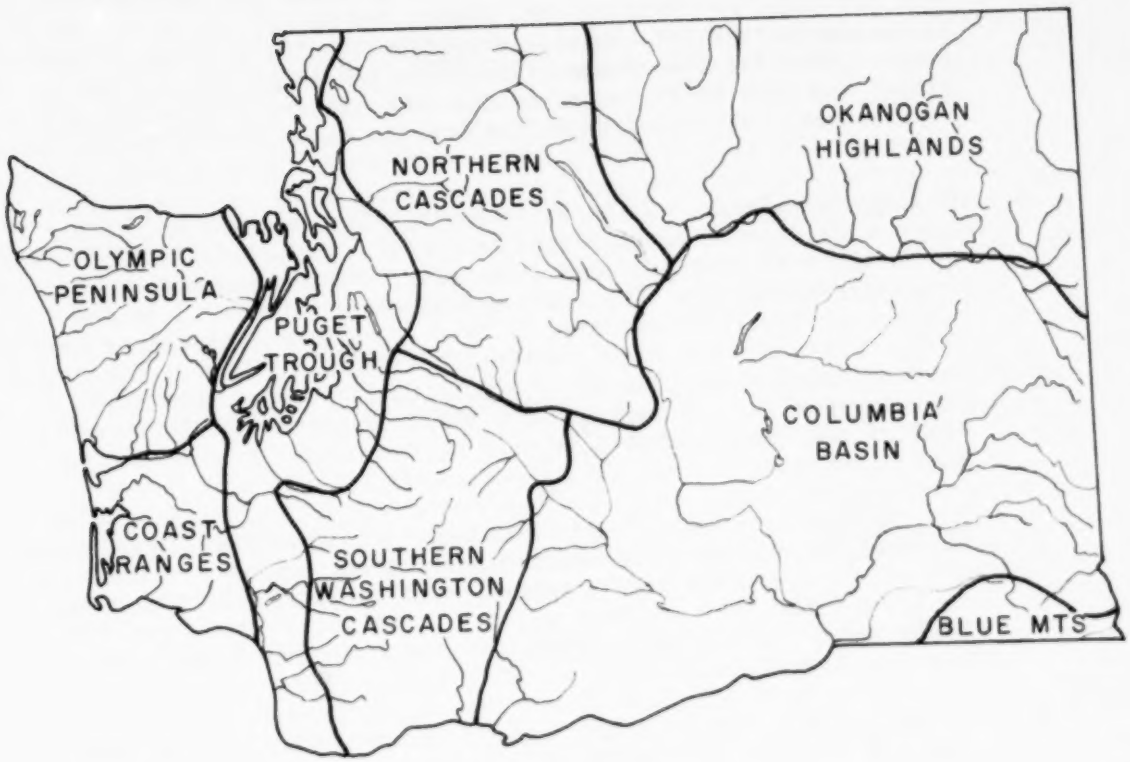

Figure 1. Physiographic Provinces of Washington
(after Franklin and Dyrness. 1973)

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Precipitation ranges from 50 inches in the lower elevations to over 120 inches in the higher areas. Dense forests dominate the lower areas and rugged peaks of great relief and over 600 glaciers predominate the higher elevations. These mountains are composed of very old sedimentary rocks. The Forest Service is the major landowner.

5. Southern Cascades. The mountains south of Snoqualmie Pass to the Columbia River are comprised of volcanic rocks and cover about 11 percent of the state. Three dominant volcanoes are included in this province: Mr. Rainier, Mt. Adams, and Mt. St. Helens. The landscape is high (Mt. Rainier elevation 14,410) and the relief is great. Precipitation ranges from 60 to 120 inches on the west slopes and down to 25 inches on the east slopes. The Forest Service and the Yakima Indian Nation are the major landholders in this area.

6. Okanogan Highlands. Situated in northeastern Washington, this province is comprised of ridges and gently rolling uplands bisected by north-south river valleys that grade into mountainous regions in the eastern portion. The lower elevations (2,000 feet) in the western portion are dominated by arid transitional grasslands and pine forests and the higher eastern portions (6,000 feet elevation) are dominated by Douglas fir. Precipitation ranges from 16-32 inches annually. The area covers about 14 percent of the state. Most of the land ownership is held by the Colville Tribe and the Forest Service.

7. Blue Mountains. Most of this province lies in northeastern Oregon but does extend into southeastern Washington. The area covers two percent of the state and is comprised of forested mountain ridges of 4,000-6,000 feet and high valleys. Precipitation ranges from 16-24 inches and relief is moderate. Most of this area is in National Forest.

8. Columbia Basin. This is the largest province in the state covering about 39 percent of Washington. Topography ranges from flat and undulating to hilly with few steep hills. Elevations range from 350 to 2,000 feet. Significant features of the province include the channeled scablands of central Washington and the Palouse Hills of the southeastern part of the state. The climate is dry with a maximum of 19 inches precipitation per year. Two major river systems, the Snake and the Columbia, are partly included in the province. Lands in the Columbia Basin are primarily in private ownership.

The diverse topography, climate, and geologic origins of the natural landscape of Washington have resulted in a complex mosaic of vegetation. Three major kinds can be distinguished: forest, steppe, and high

mountain or alpine regions. Within these broad subdivisions. nine major plant communities can be defined (termed "vegetational zones" by Franklin and Dyrness 1973). The distribution of these communities is primarily a function of elevation and precipitation (Figure 2).

1. Sitka spruce (Picea sitchensis) forest. A product of mild temperatures and high precipitation, this community is found mainly below 500 feet elevation along a coastal strip usually only a few miles in width. Its dominant species are Sitka spruce, western hemlock, and western red cedar.

2. Western hemlock (Tsuga heterophylla) forest. This is the most extensive plant community in western Washington, covering virtually the entire part of the state west of the Cascade Mountains. The climate is wet and mild with dry summers. Elevation ranges from sea level to about 3,000 feet. The principal tree species are western hemlock and Douglas fir. In the low lands around Puget Sound, many local variants are found. These are the result of low precipitation (Olympic Mountains rain shadow) and the influence of Pleistocene glaciation (soils derived from glacial drift and outwash). Prairies, oak woodland, pine forests, bogs, and marshes are examples of these.

3. Pacific silver fir (Abies amabilis) forest. The elevation range of this community is about 1,800 to 4,000 feet on the western slopes of the Cascade Mountains. It is also found in the Olympic Mountains and to a limited extent in the Okanogan Highlands and Blue Mountains. The climate is wet and cool with considerable winter snowfall. Although the characteristic tree species is Pacific silver fir, local species composition varies widely with many tree species of the lower western hemlock forest included.

4. Mountain hemlock (Tsuga mertensiana) forest. This is the highest closed forest community along the western slopes and crests of the Cascades. The upper elevation limit is about 5,000 feet. The climate is wet and very cool, with snowpacks up to 20 feet. Mountain hemlock is the principal tree species.

5. Subalpine parkland. In this category are included the subalpine meadows and tree patches that make up the area between the forest line and the completely treeless alpine regions. This parkland covers an elevation band of about 1,200 feet beginning at around 5,000 feet. The mosaic of meadow communities is complex with at least ten described for Washington. The tree patches are composed mainly of subalpine fir, mountain hemlock, and whitebark pine.

6. Alpine communities. Because of the steep, rugged topography, alpine communties are not well developed in Washington. There is a limited elevational belt between the upper limit of tree growth and

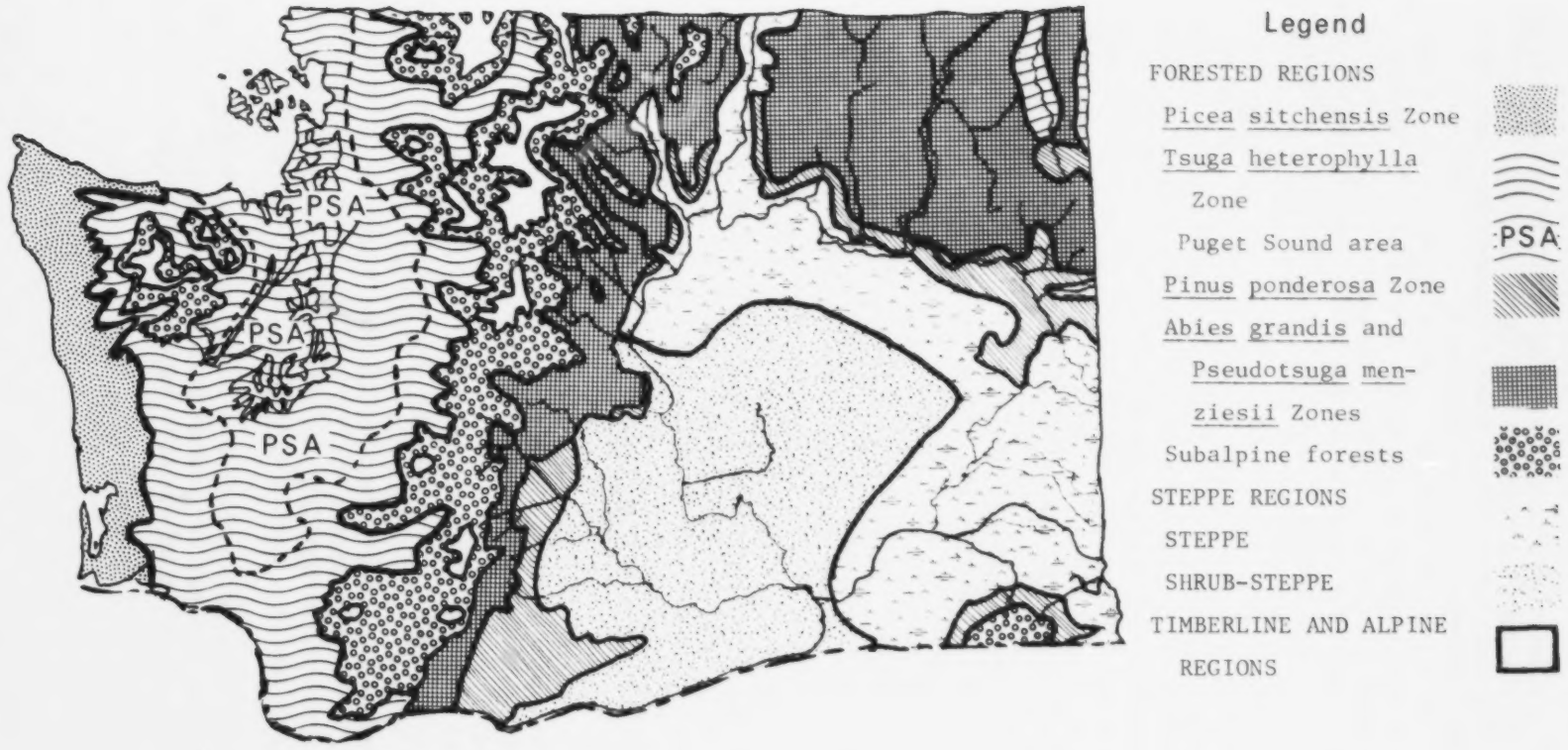


Figure 2. MAJOR PLANT COMMUNITIES OF WASHINGTON (after Franklin and Dyrness 1973)

the line of permanent ice and snow. Nonetheless, as in subalpine areas, a complex mosaic of herbaceous plant communties is found at these high elevations.

7. Douglas fir (Pseudotsuga menziesii) forest. This community occurs along the east side of the Cascade Mountains and over much of the Okanogan Highlands, typically in an elevational range of 1,900 to 4,000 feet. The dominant species is Douglas fir, although at higher elevations and in the southern Washington Cascades grand fir may occur over extensive areas.

8. Ponderosa pine (Pinus ponderosa) forest. This community occurs as a narrow band along the east slope of the Cascade Mountains and in the southern part of the Okanogan Highlands. It occupies an elevational band between about 1,900 and 3,800 feet. The predominant tree species is ponderosa pine.

9. Steppe and shrub-steppe. The Columbia Basin province of Washington is a large contiguous area of steppe and shrub-steppe vegetation. The climate is generally arid with low precipitation and hot, dry summers and cold winters. There are many diverse community types within this area. These may be strictly herbaceous (steppe) dominated by bunchgrasses such as Idaho fescue or blue bunch wheatgrass or they may contain shrubs such as big sage and bitterbrush in association with herbaceous species (shrub-steppe).

The Socio-Economic Environment

The 1976 population of Washington was 3,571,591, an average density of 53.7 per square mile. Human population growth from 1960 to 1976 was 25 percent, higher than the national average. This trend is expected to continue. The greatest concentration of population is in western Washington, where nearly 70 percent of the people live in a lowland corridor (the Puget trough province) extending from the Canadian border in the north to the Columbia River in the south.

Manufacturing, trade, and service industries account for approximately one-half of the employment in the state. Timber and timber products are important items in the economies of local areas in western, central, and northeastern parts of the state. Eleven million acres of land are in agricultural use. Grains, root crops, legumes, and fruit are grown over large areas in the central and southeastern parts of the state, while row crops (vegetables and berries) and dairying are important in the Puget Sound area. In coastal areas there is a large industry based on the marine fisheries resource. Of increasing importance is the outdoor recreation industry.

Thirty percent of the state is federally owned. The largest federal landholder is the Forest Service followed by the Department of Energy

(Hanford Reservation), National Park Service, Bureau of Land Management, Department of Army, and the Fish and Wildlife Service. Two large Indian reservations, the Colville and Yakima, occur in northeastern and south central Washington. Several smaller reservations are located throughout the state.

Washington's Wildlife Resources

Because of the great diversity in Washington's habitats, the state supports a great variety of wildlife populations. In 1978 there were 632 known vertebrate species occurring in the state. Many of these species are introduced or occur only marginally in the state. Their presence represents in many cases the edge of their normal range.

At least 220 vertebrate species have been identified by the Washington Department of Game as species of special concern. Inclusion in the list is based on uncommon occurrence, declining populations, restricted range or habitat requirements, habitat loss or other threats, or a combination of several factors--all variable.

Mammals. Washington supports 140 species of mammals, including 65 state-listed species. Federally listed mammals include the Columbian white-tailed deer and possibly the Northern Rocky Mountain wolf (both endangered) and possibly the grizzly bear (threatened). As a group, the marine mammals have the widest representation on the state list.

Birds. Approximately 375 species occur in the state including introductions. Two hundred and twenty six species are known to nest in Washington. Ninety-four species are listed by the state as species of concern. Federally listed species include peregrine falcon and the California brown pelican (endangered) and the bald eagle (threatened). Raptors have the widest representation on the state list.

Reptiles. There are 23 reptile species in Washington, including 13 listed by the state as species of concern. Many of these reptiles are marginally distributed or occur only rarely in the state. There are no federally listed species in the state.

Amphibians. Twenty-two species of amphibians occur in Washington; fifteen of which are state-listed. Occurrence for many species is marginal, rare, or very restricted. There are no federally listed species in the state.

Fish. There are 72 species of freshwater and anadromous fish in Washington, including 33 species of concern. Many of these species are introduced. There are no federally listed species in the state.

Threats to Washington Wildlife

The major threat to Washington's wildlife is from habitat loss and habitat degradation associated with the growth and development of the

state. As one of the fastest growing states in the country, pressure on wildlife habitat in many areas is tremendous and will only increase in the future.

In western Washington, where 70 percent of the state's population lives along the Puget Trough, threats to habitat are numerous. In the coastal areas many of the most valuable and unusual ecosystems--estuaries, salt marshes, mudflats, beaches, swamps, bogs, lakes, ponds, and streams--have been lost to dredging, filling, industrial development, draining and diking, channelization, and homesite development on shorelines and beaches.

Logging is also a major threat in western Washington. Virtually all of the virgin forests of the state are gone, removing important habitat for such species as spotted owls and bald eagles. Siltation of streams, log jams, and construction of roads along streams are all impacts associated with logging that have and will continue to adversely affect wildlife, especially anadromous fish.

The development of numerous dams for flood control, electric power, or municipal water have inundated thousands of acres of wildlife habitat and greatly impacted anadromous fish. This threat will continue as the demand for energy increases.

Another threat to Washington wildlife is the increased disturbance associated with human activity. As the state continues to grow and people have more free time to spend outdoors, the greater the impact. Off-road vehicles, boating, snowmobiles, and merely walking can be detrimental to wildlife if done at the wrong place or time.

In eastern Washington threats to wildlife are much the same as western Washington. Logging, dams, and increased human disturbance are all threatening wildlife.

One additional major threat to wildlife in eastern Washington is agricultural development in the Columbia Basin and associated water withdrawals for irrigation. Dryland farming, sprinkler irrigation, and the Water and Power Resources Service's Columbia Basin Project have all contributed to the conversion of thousands of acres of Palouse prairie grasslands and sagebrush rangelands into farm fields. Species such as the long-billed curlew have been greatly impacted by this habitat loss. Continued growth and development of this industry will place an increased threat on the wildlife that depend on these habitats.

Habitat Protection Programs

Existing efforts and plans for habitat protection in Washington are being carried out by a number of organizations and agencies. In some cases the protection of specific habitats is the main purpose of these

activities. In others, at least in the past, the protection of specific habitats has come about only because of other interests and activities. The following is a brief discussion of activities related to habitat protection.

1. Research Natural Area Program. This is a cooperative effort of four federal agencies (Forest Service, Bureau of Land Management, Fish and Wildlife Service, National Park Service) to identify and set aside as Research Natural Areas examples of habitat types within the States of Washington and Oregon. As of 1972, 21 such areas had been identified in Washington (Franklin and Dyrness 1973).

2. Natural Area Preserves System. The Department of Natural Resources of the State of Washington is authorized to withdraw certain lands under state ownership for scientific and educational purposes. These are to be incorporated into a Natural Area Preserves System. As of 1975 (Dyrness et.al. 1975) only two such areas totalling 25 ha had been partially protected.

3. The Nature Conservancy. As of 1975 (Dyrness et.al. 1975) this organization had established, or was in the process of establishing, 14 Nature Conservancy Preserves in Washington. At the present time, the Conservancy is conducting a Natural Heritage Program which involves the identification of lands containing ecologically valuable features and natural systems.

4. Washington State Department of Game. The Game Management Division of the Department of Game is engaged in a program of collecting data on special wildlife species and their habitats. Over the years, the Department has developed a list of areas which are of special interest to them in their game management programs. Acquisition of many of these areas is the eventual goal. Most such lands are acquired and managed for recreational purposes, primarily sport hunting and fishing. In some cases the designated "wildlife recreation areas" contain good examples of local habitat-types.

5. Washington Open Spaces Foundation. This private, non-profit organization has just become active in King County. Its purpose is to identify and acquire for preservation undisturbed examples of local habitat-types. Work is currently proceeding on the acquisition of one site.

6. U.S. Fish and Wildlife Service. There are 14 National Wildlife Refuges in Washington. A number of these refuges have excellent examples of local habitat-types.

7. Washington State Parks and Recreation Commission. The Commission is responsible for the establishment of Natural Areas and Heritage Areas on Commission lands. While lands are acquired by this agency

primarily for recreational purposes a number of state parks have fine, undisturbed examples of habitat-types.

8. The National Wilderness Preservation System. There are currently eight established Wilderness Areas within the state. Of these, six are on U.S. Forest Service lands and two are part of the U.S. Fish and Wildlife Refuge System, comprising some 2,300 square miles or about 3.5 percent of the state's land area (U.S. Department of Agriculture 1978).

9. National Park System. Three large National Parks within the state contain a variety of undisturbed habitats. Some of these have been recognized and established as Federal Research Natural Areas. The National Natural Landmark Program of the Park Service has undertaken a survey of potential Natural Landmarks of the state (as part of a broad regional approach). The surveys for western Washington (Chilcote et.al. 1976) and the Columbia Basin of eastern Washington (Daubenmire 1975) are complete. That for the Cascade Mountains is currently in progress.

10. The Department of Energy at their Hanford Reservation has incorporated two strategies to protect the natural integrity of their lands. The Department has designated part of their lands as an Arid Lands Ecology (ALE) Reserve and most of the 275,000 acre site has been incorporated into the Hanford National Environmental Research Park (NERP). Both designations are intended to preserve natural values and to limit most activity to scientific research of natural ecosystems.

11. The Forest Service manages 10 national forests in the state. Many wildlife habitats are adequately protected under present management, especially those sites at the higher elevations.

Summary

The wildlife habitats of Washington have been, and will continue to be, threatened by continued growth of human populations. Agricultural expansion, industrial and residential development, and recreational activities are a few of the impacts that are adversely affecting native habitats and their wildlife.

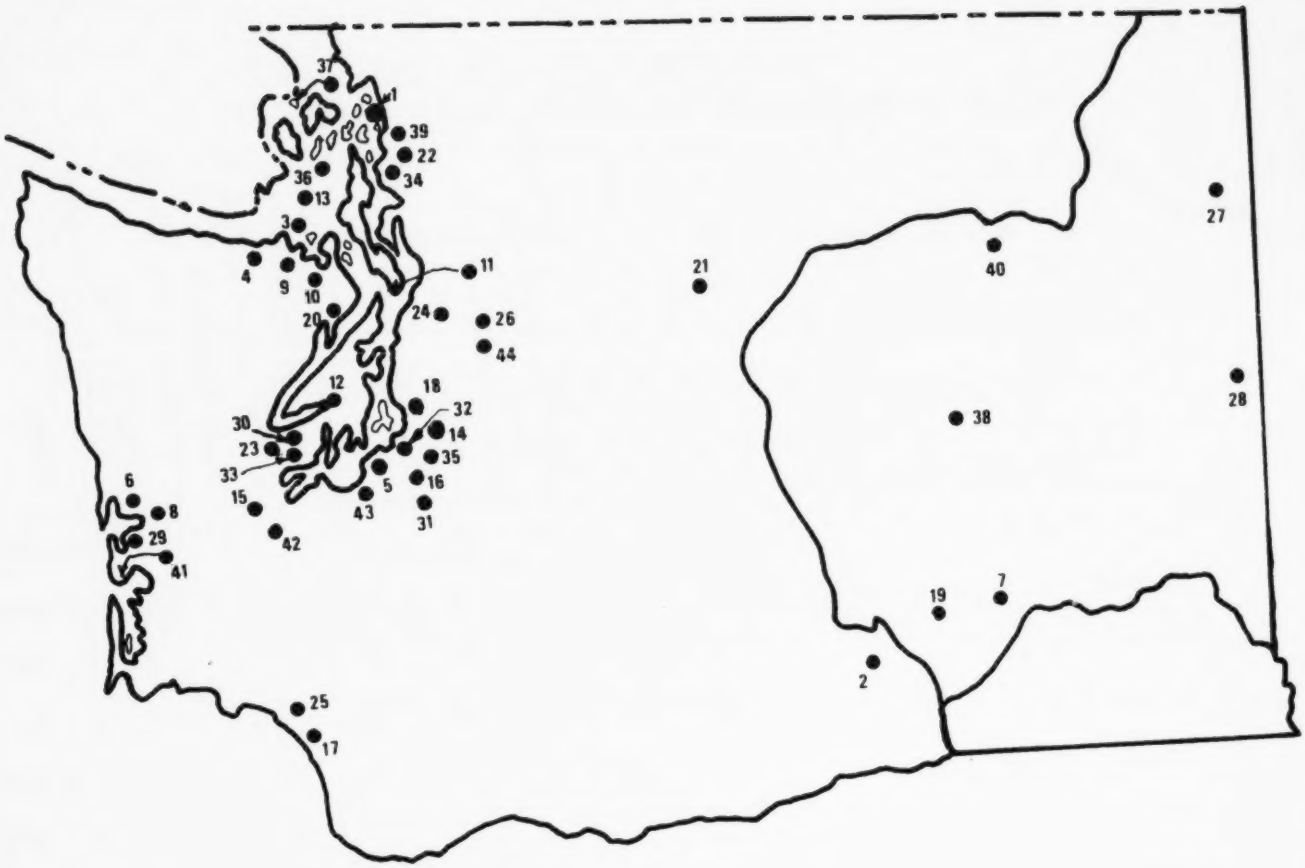
Numerous federal, state, county, city, and private entities have recognized this threat and have initiated efforts to regulate growth and development and to protect critical habitats. Continued efforts toward habitat protection, be it through zoning, regulations, easements or acquisition, are needed if Washington is to continue to enjoy its rich heritage of diverse and scenic wildlife habitats and the plants and animals that are dependent upon those habitats for existence.

INVENTORY METHODS

The inventory program was accomplished in three stages: nomination, data collection, and evaluation. Nominations were solicited from resource agencies, universities, conservation groups and individuals. Nominated sites were then reviewed by a team of biologists and most sites were field checked. Nominations for 44 sites were considered in this review (see Figure 3 for sites). During the review, additional data was collected to corroborate the information provided in the original nomination. Finally, the sites were ranked using an evaluation system which stressed the importance of rare wildlife, unusual or threatened habitats, and the degree of threat to the site. Twenty sites were ranked at this time (Table 1). Sufficient information was not available to adequately evaluate the other nominated sites.

The rankings are not static. As additional technical information becomes available, or as threats increase or decrease, the order or rankings will be revised.

The following sections provide further information on both ranked and unranked sites.



LEGEND

1. Padilla/Samish Bays
2. Hanford Reach
3. Protection Island
4. Sequim Bay
5. McNeil Island
6. Point New
7. Juniper Woods
8. Bowerman Basin
9. Graysmarsh
10. Kah Tai Lagoon
11. Deer Lagoon
12. Union River Estuary
13. Crockett Lake
14. Renton Marsh
15. Black River Swamp
16. Tukwila Pond
17. Fisher Island
18. Kellogg Island
19. Upper Esquatzel Coulee
20. Thorndyke Marsh
21. Alta Lake Coulee
22. Barney Lake
23. Camp Pond
24. Carnation Marsh
25. Coal Creek Slough
26. Cranberry Bog
27. Cusick Meadow
28. East Farms
29. Elk River Estuary
30. Goat Ranch Pond
31. Great Blue Heron Marsh
32. Green River Bottoms
33. Howell Lake
34. Ika Island
35. Kent Lagoons
36. Long Island (San Juan Co.)
37. Point Disney
38. Rocky Ford Creek
39. Samish Island Heron Rookery
40. Seaton Canyon
41. Shoalwater Marsh
42. Springer Lake
43. Wier Prairie
44. Yellow Lake

Figure 3. Site location

TABLE 1

WASHINGTON IMPORTANT FISH AND WILDLIFE HABITAT RANKING

Values:

L - Low

M - Medium

H - High

RANK	CANDIDATE AREAS	Species Value	Habitat Value	Secondary Biological Value	Threat	Total	Education & Recreation Values	Development Cost	Management Cost	Acres
1.	Padilla/Samish Bay	24	23	14	20	81	H	L	H	18,200
2.	Hanford Reach - Columbia R.	21	20	21	18	80	M	L	M	25,000+
3.	Protection Island	21	21	14	19	75	H	L	M	346
4.	Sequim Bay	23	17	10	20	70	H	L	M	3,325
5.	McNeil Island	21	9	13	16	59	H	L	H	4,400
6.	Point New	19	18	8	12	57	M	L	L	348
7.	Juniper Woods	18	19	7	11	55	H	L	M	8,500
8.	Bowerman Basin	19	5	13	18	55	M	L	L	540
9.	Graysmarsh	23	6	13	12	54	M	M	M	850
10.	Kah Tai Lagoon	20	6	9	18	53	H	L	L	100
11.	Deer Lagoon	20	5	10	18	53	M	L	L	400
12.	Union River Estuary	19	5	9	19	52	M	L	L	340
13.	Crockett Lake	19	5	8	18	50	M	H	H	200
14.	Renton Marsh	19	4	9	18	50	M	M	M	2,200
15.	Black River Swamp	19	5	7	16	47	L	L	L	775
16.	Tukwila Pond	16	1	9	18	44	H	L	M	39
17.	Fisher Island	21	3	6	13	43	L	L	L	186
18.	Kellogg Island	14	1	8	19	42	L	L	L	14
19.	Upper Esquatzel Coulee	19	1	8	13	41	L	L	L	?
20.	Thorndyke Marsh	10	8	8	15	41	H	L	M	40

SITE DESCRIPTIONS

LOWER SAMISH BAY AND PADILLA BAY

I. STATE: Washington COUNTY: Skagit ACRES: Samish 3,200+
Padilla 12,000+

LEGAL DESCRIPTION: Samish: T36N R2E, T35N R2E, T36N R3E
Padilla: T34N R2E, T35N R3E

II. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

A. Reason for uniqueness or national significance

Lower Samish and Padilla Bays contain a significant percentage of the remaining estuarine habitat available to large numbers of migratory waterfowl, shorebirds, and raptors in the Pacific Northwest. The richness of these sites attracts a diverse and abundant assemblage of wildlife species.

Padilla Bay represents probably the largest and least disturbed stand of eelgrass left on the west coast of the United States.

B. Endangered, threatened, or endemic species (including plants and invertebrates)

The Samish/Padilla Bays and the adjacent shoreline areas support the largest known wintering population of peregrine falcons in North America. At least nine peregrines were present during the winter of 1976-77.

One pair of bald eagles nest on the east shore of Padilla Bay. As many as 20 bald eagles winter in the area.

There are no known plant or invertebrate species listed as threatened or endangered in the area; however, survey work has been very limited.

C. Species abundance and diversity

Raptors are uniquely abundant in these areas during the winter months. Commonly, 100 raptors of 11 species winter in these areas. Merlins and snowy owls are frequently seen.

The bays winter approximately 50,000 ducks of 26 species. Over 20,000 brant have been recorded in these areas during spring migration.

Wintering shorebirds number in the thousands. The most abundant species is the dunlin. Overall bird diversity exceeds 200 species making it one of the most diverse areas for bird life in the state.

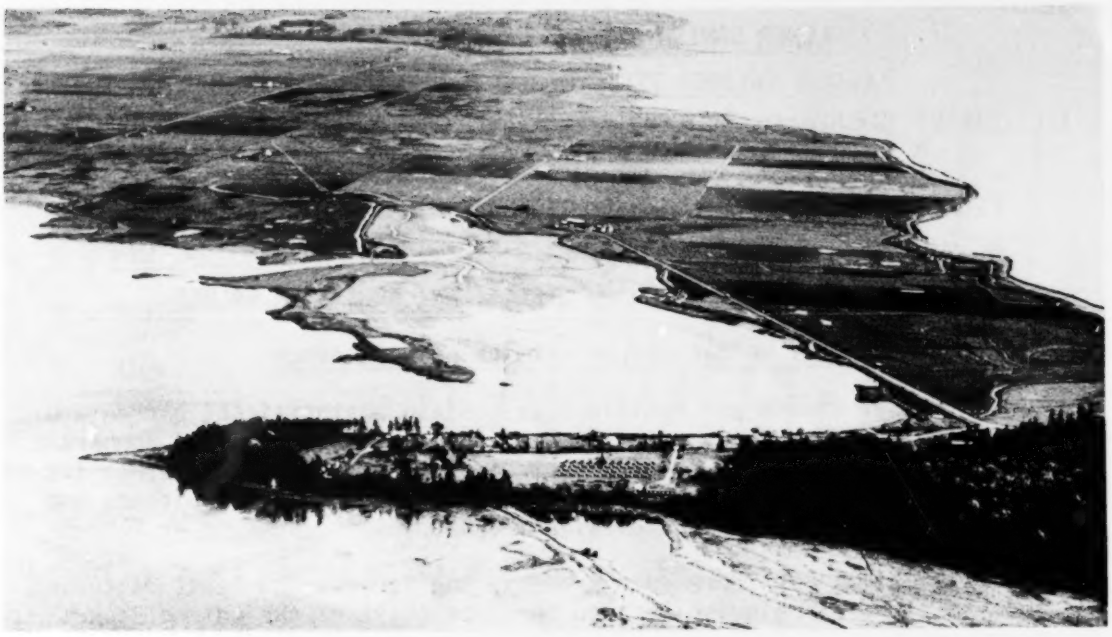
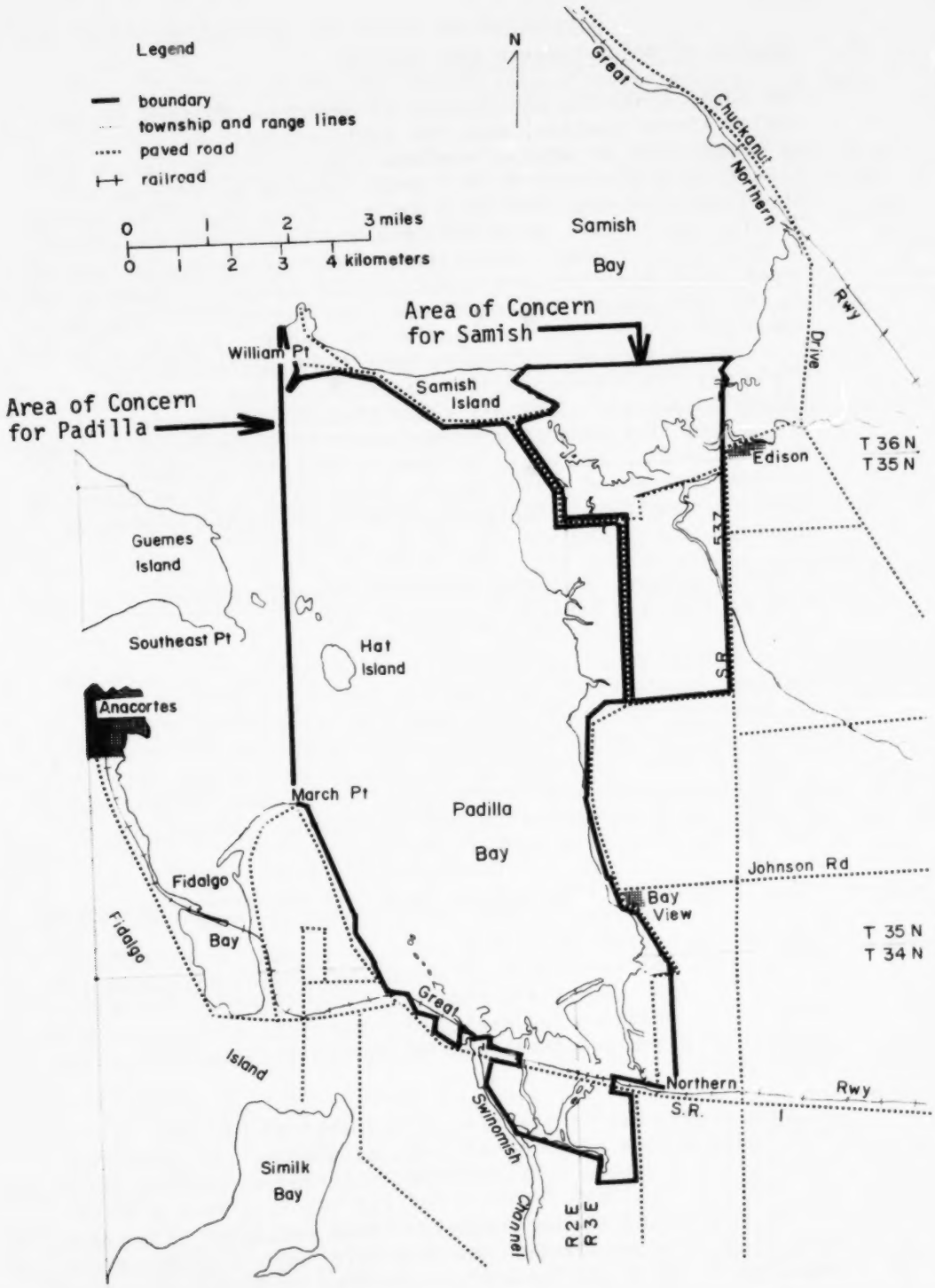


FIGURE 4 View SSE from north of Samish Island, showing lower Samish Bay subunit in mid-foreground, Bayview and South Padilla Bay in background.

FIGURE 5 View ENE from north Padilla Bay, showing all but western edge of South Samish Bay subunit. Samish River upper right.



The Samish/Padilla Bay Unit showing the location of the two subunits relative to one another.

D. Species of major concern and reasons

The large wintering populations of peregrine falcons (a federally listed species) make the Padilla/Samish Bays and adjacent flats an area of national concern. The falcons have historically wintered in this area, feeding on the numerous shorebirds and waterfowl that winter in the bays. These prey species are in turn dependent upon the natural biotic richness of the bays for their subsistence. The spring populations of brant using Padilla/Samish Bays are the largest concentrations on the west coast, outside of Mexico. The bays are the most important spring staging area for the Pacific flyway. The bay is critical because it is here that the brant build premigratory fat reserves before departing on their non-stop flight to Alaska. If Padilla/Samish Bays and the rich eelgrass beds they support were not available, the Pacific flyway population of brant would be greatly impacted primarily because they would arrive on the breeding grounds in poorer physical condition. Reproductive success would likewise be impacted.

E. Wildlife values, including different and outstanding wildlife associations and habitat types

As an ecosystem of great diversity and richness the bays are integral to the food chain of many species. Besides being important areas for raptors, waterfowl, and shorebirds, the bays are important spawning and nursery grounds for a variety of marine fish including herring, flatfish, various bait fish, and salmonids, especially pink and chum salmon. Harbor seals use both areas. The herons feed throughout both bays on the rich animal life that abounds there.

F. Relict, localized, limited, or otherwise significant ecosystems

Many of the biologically rich bays, estuaries, and intertidal areas along the west coast of the United States have been lost to filling for industrial, commercial, residential, or recreational use; dredging for navigation channels, marinas, or boat basins; or diked and developed for agriculture and other land development.

An undeveloped bay of the size and biological richness of Padilla/Samish is becoming a rarity as demands for shoreline development increase. In addition, a large undisturbed stand of eelgrass like that found in Padilla Bay is almost a thing of the past along the west coast. These remaining eelgrass beds play an increasingly important role in maintaining brant populations which are rapidly diminishing in direct proportion to the dwindling eelgrass supply.

III. THREAT OF DESTRUCTION/DEGREE OF PROTECTION

A. Nature of threat and probability of occurrence within two, five, or 10 years

The largest single landowner in the Padilla/Samish Bay is a development corporation. Their strategy over the past few years has been to buy out smaller owners to gain controlling interest of the tidelands.

Development scenarios include recreational homesites and diked agricultural land. The threat of development is immediate.

B. Severity of impact and permanence of change

All development proposals to date would have a disasterous, and for the most part permanent, impact on Padilla/Samish Bays.

Diking and/or dredging and filling would eliminate eelgrass beds and destroy mudflats and salt marshes. The many species of plants and animals that are dependent on these habitats would be adversely affected by this loss.

C. Degree of protection

Padilla/Samish Bays are protected by numerous statutes and regulations at the federal, state, and local level that prohibit adverse dredge/fill activities in coastal wetlands.

Because of various considerations, and strong local sentiment in favor of development, laws and regulations have been only partially successful in protecting natural values of such sites as Padilla/Samish. The principal assured avenue for protection is from special legislation and/or acquisition and management as a marine park, wildlife refuge, research natural area, wilderness area, etc.

IV. ECOSYSTEM DESCRIPTION

A. Land use (agriculture, tree farms, suburban lands, etc.)

Most of Padilla/Samish Bays are intertidal and subtidal mudflats and eelgrass beds. Disturbance on these sites is minimal. On Padilla Bay there is an estimated 12,500 acres of tidelands and on Samish Bay 1,100 acres.

Diked agricultural land lying south of Samish Bay and east and south of Padilla Bay is the second most abundant habitat type in the area of concern. Most of this land is reclaimed tidelands in private ownership that is used for dairy pasture or

vegetable crops. Approximately 3,650 acres of diked agricultural lands are in the area of concern.

Approximately 700 acres of salt marsh lie between the bay and the upland dikes of Padilla Bay. Most of this marsh occurs on the south and east shores. In Samish Bay there are approximately 51 acres of salt marsh.

There are 150 acres of timber and brushland in the area of concern. The largest single tract of timber is Hat Island in Padilla Bay. Other woodlots occur on the east shore of Padilla Bay.

B. Physical description (geology/soils, topography, climate)

Padilla and Samish Bays are part of an extensive lowland plain formed by the Skagit River. Soils are alluvial deposits of clay, silt, and sand.

Padilla Bay lies east of Anacortes in northern Puget Sound. The lands are drained by Indian and Telegraph Sloughs.

South Samish Bay lies west of Edison, Washington between Samish River on the southeast corner and Samish Island on the west.

The tidal flats and salt marshes of the two areas are essentially flat. Most tidelands are less than two meters in depth. An earth dike approximately 2.3 meters high separates the tidelands and salt marsh from the agricultural land.

C. Vegetation/Habitat

The intertidal and subtidal areas are dominated by dense stands of eelgrass. Colonial diatoms and several algal species are present.

In the salt marshes, seashore saltgrass and pickleweed predominate. Other species include orache, Canada sandspurry, gumweed, seaside arrowgrass, and foxtail barley. Wigeongrass is present in brackish pools. Grasses and forbs occur on the dike and in the agricultural areas.

V. OWNERSHIP INFORMATION

Type of Ownership	No. of Ownerships	Residences	Acres	Cost Est.
Private	50+	Few	6,500?	Unknown
County	1	0	100	
Corporate	1	0	7,500+	
Tribal	1	0	150±	
State	Several	0	Unknown	

VI. OTHER AVAILABLE INFORMATION

A. Identified by others as an area of concern

The area has been identified by the North Cascades Audubon Society, Western Washington University, U.S. Fish and Wildlife Service, and the Washington State Departments of Game, Fisheries, and Ecology as an area of concern.

B. Other available information (publications, reports, etc.)

Additional information is available from the U.S. Fish and Wildlife Service, Area Office, Olympia, Washington.

VII. ADDITIONAL COMMENTS

A. Controversial aspects related to the site

Controversy could be expected if changes in land status should be proposed as part of the preservation strategy, especially on one tract of tribal land.

B. Availability

Unknown

C. Possible means of protection

The Washington Department of Ecology is considering portions of Padilla Bay for an estuarine sanctuary. The Department received preliminary acquisition funds, from NOAA, which will cover studies and management plans. An environmental impact statement is being prepared, and an application for matching federal funds will be sent to NOAA during FY 1980. Samish Bay is not covered in this request. Designation as a state park, wildlife recreation area, research natural area, or national wildlife refuge are all other possible alternatives that could offer some level of protection.

D. Estimated annual operational/maintenance expenditures

Unknown

E. Development needs

The Padilla/Samish Bays are naturally functioning ecosystems and do not require any development or alteration.

If public use programs were incorporated into the management program then development of recreational facilities would be required.

F. Recreational and/or environmental education potential

The site has tremendous potential for environmental education, wildlife observation, interpretation, and recreation. Hunting,

fishing, boating, and shellfish gathering are all recreational opportunities that are available; however, some restrictions and control would have to be enforced to minimize conflicts with wildlife populations.

G. History

Unknown

H. Archeological information

Unknown

HANFORD REACH OF COLUMBIA RIVER

I. STATE: Washington COUNTY: Yakima, Benton, Grant, Franklin TOTAL ACRES: Minimum 25,000

LEGAL DESCRIPTION: Columbia River and adjacent lands from river mile 345 to Priest Rapids Dam (River Mile 397) and lying within the following area:

T13N R23E, 24E, 25E, 26E, 27E 28E,
T14N R25E, 26E, 27E,
T12N R28E,
T11N R28E,
T10N R28E.

II. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

A. Reason for uniqueness or national significance

The Hanford Reach is the last significant (over 50 river miles) free flowing reach of the Columbia River in the United States. The rest of the Columbia has been inundated and drastically altered by dams and reservoirs created for hydroelectric power generation and irrigation diversion. Because the Hanford Reach is still free flowing it represents the most diverse fish and wildlife habitat area on the mid-Columbia River.

The Hanford Reach lies almost totally within the Department of Energy's Hanford Reservation which has been closed to public access since 1942. This unique situation has provided a sanctuary where plants and animals have remained protected from the surrounding pressures of human growth and development for over 35 years.

B. Endangered, threatened, or endemic species (including plants and invertebrates)

The reach is used as a wintering area by as many as 15 bald eagles. Peregrine falcons may use the area during migration.

One plant species Allium robinsonii, listed by the Smithsonian Institute as threatened, occurs on the site. Another plant, Astragalus columbianus, once thought extinct, has been recently collected on the reach.

Two invertebrate species, Lanx nutalli nutalli (the giant Columbia River limpet) and Lithoglyphus columbiana (the giant

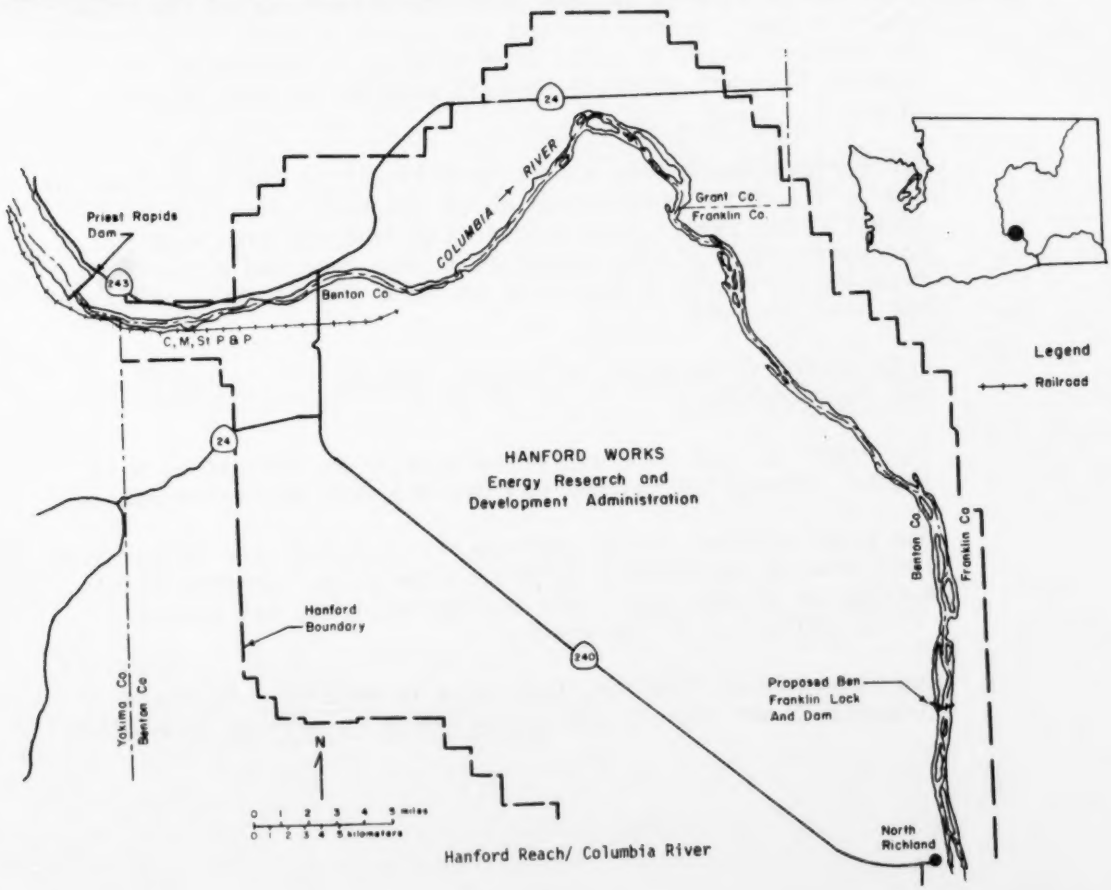

24
Priest Rapids Dam
243
Benton Co
COLUMBIA RIVER
Grant Co
Franklin Co
C, M, St P & P
Legend
Railroad
HANFORD WORKS
Energy Research and Development Administration
24
Hanford Boundary
240
Yakima Co
Benton Co
Proposed Ben Franklin Lock And Dam
Benton Co
Franklin Co
N
0 1 2 3 4 5 miles
0 1 2 3 4 5 kilometers
North Richland
Hanford Reach/ Columbia River

Figure 6.

Columbia River spire snail), are believed to be endemic to the Hanford Reach. A recommendation to classify these species as endangered has been made to the Fish and Wildlife Service but an official determination has not been made yet.

C. Species abundance and diversity

Forty-three species of fish occur in the diverse aquatic habitats of the reach. Avian abundance is high for colonial nesting species, wintering waterfowl and nesting Canada geese. Avian diversity is high including some of the most diverse raptor use in the state (21 species, 10 of which nest on or adjacent to the reach). Five amphibian, ten reptile, and at least 35 mammal species occur in the area.

D. Species of major concern and reasons

There are 21 state-listed species of fish occurring in the Hanford Reach. Included are the white sturgeon and the uncommon sand roller. The reach is the last major natural salmonid spawning area on the Columbia and annually supports 20,000 to 30,000 spawning fall chinook and 10,000 steelhead trout.

There are at least 21 state-listed species of birds that use the reach or adjacent lands. Most notable are prairie falcons (8 nesting pairs) and long-billed curlews.

Other state-listed animals on the reach include one mammal, three amphibian, and five reptile species.

E. Wildlife values, including different and outstanding wildlife associations and habitat types

Within the Hanford Reach, colonial nesting species include a black-crowned night heron rookery of 20 pairs (1974), a Forster's tern colony of 25 pairs, two ring-billed gull colonies (1,200 pairs), two California gull colonies (600 pairs), and a great blue heron rookery of 100 pairs.

On the reach there are 17 islands of high wildlife value. Canada geese numbering 100 to 300 pairs nest on these islands and have, in some years, produce over 800 young. This production is approximately 15 percent of the state total for Canada geese.

Mule deer use the islands extensively for fawning. Thirty to fifty fawns are born on the islands annually.

The islands are used as loafing sites by 30,000 to 50,000 wintering ducks, primarily mallards, and 3,000 to 6,000 wintering Canada geese.

F. Relict, localized, limited, or otherwise significant ecosystems

Native riparian habitat, free flowing riffles, gravel bars, oxbow ponds, back water sloughs, and the White Bluffs are all localized and limited habitats of the Columbia River present in the Hanford Reach.

III. THREAT OF DESTRUCTION/DEGREE OF PROTECTION

A. Nature of threat and probability of occurrence within two, five, or 10 years

The threat to the Hanford Reach is immediate. The U.S. Army Corps of Engineers in the 1960's proposed that the Ben Franklin Dam be built at approximately River Mile 348. This hydroelectric dam and reservoir would inundate the Hanford Reach and destroy most of the area's inherent value to fish and wildlife. The proposal was first dropped in 1969 because of objections from the U.S. Fish and Wildlife Service and other agencies concerned about the environmentally damaging impacts of the project. However, the proposal is now being reconsidered.

Other threats include a proposal by the Corps to dredge a navigation channel from Richland to Priest Rapids Dam, upstream pumped storage, power peaking, increased withdrawals for irrigation, and increased public access to the reach. The feasibility of a navigation channel appears economically impractical at this time.

B. Severity of impact and permanence of change

Ben Franklin Dam is the most environmentally damaging of the threats to Hanford Reach. The dam would permanently eliminate most salmonid spawning areas and possibly cause the extinction of two invertebrate species; the giant Columbia River limpet and the giant Columbia River spire snail. Eighty percent of the islands would be inundated; greatly impacting Canada goose nesting, mule deer fawning, and winter waterfowl use. Riparian habitats would be eliminated and would not be expected to reestablish themselves for at least 30 to 50 years.

The proposed navigation channel would have permanent though less severe impacts. Salmonids, waterfowl, deer, raptors, spawning gravel beds, and riparian vegetation would be affected. Power peaking, pumped storage, irrigation withdrawals and increased public use are expected to have similar impacts.

C. Degree of protection

The Hanford Reach has been designated part of the Hanford National Environmental Research Park (NERP). Public access along most of the shore is controlled or prohibited by the Departments of Army, Energy, and Interior, and by the State Departments of Game and Fisheries which manage the Wahluke Recreation Area (WRA) and the Ringold Springs Fish Rearing Ponds. The NERP designation would not prevent the construction of Ben Franklin Dam.

IV. ECOSYSTEM DESCRIPTION

A. Land use (agriculture, tree farms, suburban lands, etc.)

Most of the land along the Hanford Reach is in Federal ownership (Department of Energy). The land is managed as a buffer zone for the nuclear reactor sites on the Hanford Reservation. Development is minimal. The U.S. Department of Army, Yakima Firing Center, owns a small, undeveloped parcel of the reach below Priest Rapids Dam on the west bank.

The Fish and Wildlife Service manages Department of Energy lands as the Saddle Mountain National Wildlife Refuge on the north shore (RM 373 to 392) and the Washington Department of Game manages Department of Energy lands as the Wahluke WRA on the north shore (RM 355 to 373). Most private land is restricted to the east bank above Richland.

B. Physical description (geology/soils, topography, climate)

The reach is contained wholly within the Columbia Basin physiographic province. The topography ranges from flat and undulating to hilly with elevations 300 to 2,000 feet near the river. The climate is hot and dry in the summer and cold in the winter. Precipitation throughout most of the area is less than 12 inches.

C. Vegetation/habitat and estimated acreage

Major vegetational habitats along the reach are shrub steppe (dominated by Artemisia tridentata - Agropyron association) and steppe (Artemesia tripartita - Festuca associations). Limited riparian habitats of sedges, willow, poplars, etc.,, occur along the riverbanks and islands. Riparian acreage estimates along the Ben Franklin Reservoir site are: trees 365 acres, shrubs 2,615 acres, grass 3,310 acres, sedges and herbs 2,965 acres.

V. OWNERSHIP INFORMATION

Type of Ownership	No. of Ownerships	Residences	Acres	Cost Est.
Private	Few	Few, if any		Unknown
Federal	2	None	20,000+	None

VI. OTHER AVAILABLE INFORMATION

A. Identified by others as an area of concern

The Washington Department of Game, National Marine Fisheries Service, Department of Energy, Battelle Pacific Northwest Laboratories, Pacific Northwest Regional Commission, Pacific Northwest River Basin Commission, and the Columbia River Conservation League (CRCL) have all identified the reach as an area of concern.

B. Other available information (publications, reports, etc.)

Numerous scientific studies of the Hanford Reach have been conducted by Battelle Pacific Northwest Laboratories at Richland. The U.S. Army Corps of Engineers has recently completed a study of riparian habitats of the Columbia River. Additional information is available from the U.S. Fish and Wildlife Service, Olympia Area Office.

VII. ADDITIONAL COMMENTS

A. Controversial aspects related to the site

Efforts to preserve the natural integrity of the reach will impact local, state, and federal entities that are interested in developing the reach for hydropower and recreation.

B. Availability

Most of the land is administered by the Department of Energy. Acquisition of private lands would be minimal.

C. Possible means of protection

Most of the land is already in federal ownership. Possible alternatives for protection include: National Environmental Research Park (present status), National Wildlife Refuge, Wild and Scenic River, Research Natural Area, National Natural Landmark, National Historic Landmark (first nuclear reactor site in U.S.), National Registry for Archeological Sites, or special congressional legislation.

D. Estimated annual operational/maintenance expenditures

These costs would be minimal if the reach is left in its present natural state; however, if recreation sites are developed, operation and maintenance costs could be substantial.

E. Development needs

Development of additional riparian habitats (tree plantings, etc.) would greatly benefit wildlife along the reach. Other development needs would be dependent upon the final determination for the reach (development or preservation) and the management scenario that is implemented.

F. Recreational and/or environmental education potential

The reach has tremendous potential for sport fishing, hunting, camping, picknicking, boating, and education. However, many of these activities would impact fish and wildlife populations, e.g., people on islands during goose nesting and deer fawning. Many of these recreational and educational opportunities may be precluded by the overriding considerations for the Hanford Project, the needs for security and protection for human health and safety.

G. History

Old townsites of Hanford, Wahluke, and White Bluffs occur along the reach. One cabin associated with the Hudson Bay Company dates back to the 1850's. Because the Hanford Reservation represents the first major endeavor in nuclear science in the world, the site has great historical value and may some day be designated as a National Historic Landmark.

H. Archeological information

The reach is very rich in archeological resources. There are 105 known sites, three of which are probably significant enough to warrant full excavation and national registry.

PROTECTION ISLAND

I. STATE: Washington COUNTY: Jefferson TOTAL ACRES: 346

LEGAL DESCRIPTION: T31N R2W Sec.33, 34
T30N R2W Sec.3, 4

II. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

A. Reason for uniqueness or national significance

Protection Island has the greatest numbers of nesting seabirds anywhere in Puget Sound. The diversity of bird species using the island for nesting and other purposes probably exceeds that for any other similar area in Washington.

B. Endangered, threatened, or endemic species (including plants and invertebrates)

A bald eagle nest is present in the remnant conifer forest at the north end of the island. Migrant and wintering bald eagles are occasionally seen.

Peregrine falcons are known to use nearby areas such as Dungeness Bay and Sequim Bay and probably use the island on occasion during migration or for hunting. There are no known plant or invertebrate species listed as threatened or endangered occurring on the island.

C. Species abundance and diversity

Approximately 170 species of birds have been recorded on the island. Over 40,000 seabirds nest on the island during the spring and summer months. Limited numbers of waterfowl winter near the island.

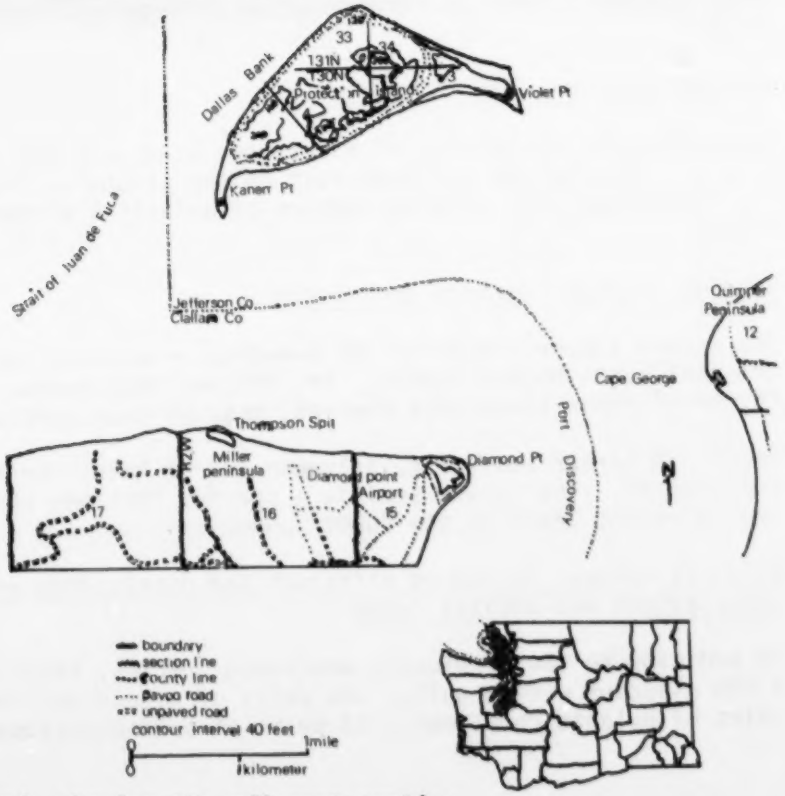
D. Species of major concern and reasons

The island supports half of the breeding rhinoceros auklets in the contiguous United States. In 1975 and 1976 approximately 40,000 of these birds were present, most of them nesting.

About 90 harbor seals regularly use Violet Point for hauling out and pupping. The harbor seal is a species that has been declining in recent years in the Puget Sound.

E. Wildlife values, including different and outstanding wildlife associations and habitat types

In addition to the previously mentioned species, there are also 4,000 glaucous winged gulls, 180 pairs of pigeon guillemots, 194 pairs of pelagic cormorants, 33 pairs of tufted puffins and six



Protection Island, showing the adjacent portion of the Olympic Peninsula.

Figure 7.

pairs of black oyster catchers that nest on the island. The island is the last nesting site for the tufted puffin in Puget Sound.

The area is also a summer concentration area for male harlequin ducks.

F. Relict, localized, limited, or otherwise significant ecosystems

Coastal seabird nesting islands of this magnitude and diversity are truly unique, significant, and very limited along the entire west coast. The limited number of such places increases the importance of these island ecosystems to the species that are dependent upon them.

III. THREAT OF DESTRUCTION/DEGREE OF PROTECTION

A. Nature of threat and probability of occurrence within two, five, or ten years

Between 1969 and 1972 Protection Island was subdivided by a development company into 1,098 residential lots. In 1974 land sales and building permits were suspended because of lack of potable water. Building to date has been minimal. If a source of fresh water were located, construction would probably continue almost immediately.

B. Severity of impact and permanence of change

Building has occurred over the same areas where the auklets burrow for nesting. Such development has severe and permanent impacts on these birds.

In addition, the increased factor of human disturbance, including free-roaming dogs and cats, also adversely impacts island nesting birds located away from the building sites.

C. Degree of protection

Unfortunately there is very little that can be done to stop the development by those who purchased lots on the island.

IV. ECOSYSTEM DESCRIPTION

A. Land use (agriculture, tree farms, suburban lands, etc.)

There are 41 buildings and structures on the island, primarily summer homes and recreational cabins. Some day-use by birdwatchers, boaters and fishermen takes place.

Most of the island is open grass and forb pasture land that was once grazed by sheep but is now idle.

B. Physical description (geology/soils, topography, climate)

Protection Island lies about seven miles north of Port Townsend in the Strait of Juan de Fuca. The island rises 206 feet above sea level and is 2,600 yards long and 846 yards wide.

About 80 percent of the island is a plateau. Habitats include open fields, a small mixed conifer forest, tufted grass and pasture, sandspit, cobble beach and sandstone cliffs.

The island substrate is comprised of alluvian and marine deposits of silt, sand and gravel. The sandstone cliffs are ideally suited for burrow nesting birds. The paleontological value of the island is high.

The island lies in the rain shadow of the Olympic Mountains. The climate is mild.

C. Vegetation/habitat and estimated acreage

Vegetation over most of the island is grass (quack grass, Pacific brome, velvet grass, orchard grass) and forbs (yarrow, lupine, Pacific sagewort, and Canada thistle). Alfalfa was introduced and persists commonly. Beachgrass is common in the dune areas.

The forested areas include Douglas fir, Pacific yew, western red cedar, grand fir, and madrone. Common understory shrubs are thimbleberry, snowberry and ocean spray. Kelp and eelgrass are found on the north and south shores of the island.

V. OWNERSHIP INFORMATION

Type of Ownership	No. of Ownerships	Residences	Acres	Cost Est.
Private	701	41	346	

VI. OTHER AVAILABLE INFORMATION

A. Identified by others as an area of concern

The island has been identified as an area of concern by the Seattle, Admiralty, Tahoma, Olympic Peninsula and the National Audubon Society; National Washington Environmental Council, Washington Department of Game, Washington Department of Natural Resources, and several interested individuals.

In 1975, the Washington Department of Game dedicated a 48-acre "preserve" near the west end of the island. The area includes the burrows for about 30 percent of the nesting auklets.

B. Other available information (publications, reports, etc.)

Several scientific studies and publications on Protection Island have been made and complete plant and bird lists are also available. Further information can be obtained from the U.S. Fish and Wildlife Service, Area Office, Olympia, Washington.

VII. ADDITIONAL COMMENTS

A. Controversial aspects related to the site

Change of status could be expected to be opposed by some landowners.

B. Availability

If no suitable source of freshwater is found, many of the landowners probably would not pursue development.

C. Possible methods of protection

Designation as a research natural area, national wildlife refuge or state non-game preserve are all suitable alternatives for preservation. Park designation would probably not be suitable because it would attract too many people to a fragile and sensitive wildlife area where people would adversely impact nesting birds and the harbor seals on Violet Point.

D. Estimated annual operational/maintenance expenditures

Unknown.

E. Development needs

Signing, physical barriers, and possibly some fencing are probably the only developmental needs on the island.

F. Recreational and/or environmental education potential

Most recreational activities are not compatible with the nesting birds of the island.

Environmental education has some potential but the isolation of the site limits opportunities.

Probably the most suitable and compatible use of the island would be scientific research. Limited bird watching, photography, etc. could be allowed under controlled conditions.

G. History

The island was discovered and named by Captain George Vancouver when he landed on the area in 1792.

H. Archeological information

Several archeological investigations have begun on the island with prehistoric mammoth and human bones uncovered.

SEQUIM BAY

I. STATE: Washington COUNTY: Clallum TOTAL ACRES: 3,325

LEGAL DESCRIPTION: T29N R3W
T30N R3W

II. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

A. Reason for uniqueness or national significance

Sequim Bay is a sheltered cove located on the Strait of Juan de Fuca. It represents a rich biological area in a region where coastal sites are under extreme pressure for development. It is a significant island of wildlife habitat in western Washington.

B. Endangered, threatened, or endemic species (including plants and invertebrates)

Peregrine falcons have been observed in the bay during the winter and migration periods. Bald eagles also frequent the area, but none nest on the bay. Threatened or endangered plants and invertebrates have not been surveyed in the area.

C. Species abundance and diversity

Over 125 species of birds use the bay. Brant, whistling swans, many duck species, shorebirds, wading birds and seabirds use the bay extensively.

D. Species of major concern and reasons

Use of the bay by raptors, shorebirds and waterfowl is of special concern because of the declining amount of habitats that are remaining in Puget Sound and available to these birds.

E. Wildlife values, including different and outstanding wildlife associations and habitat types

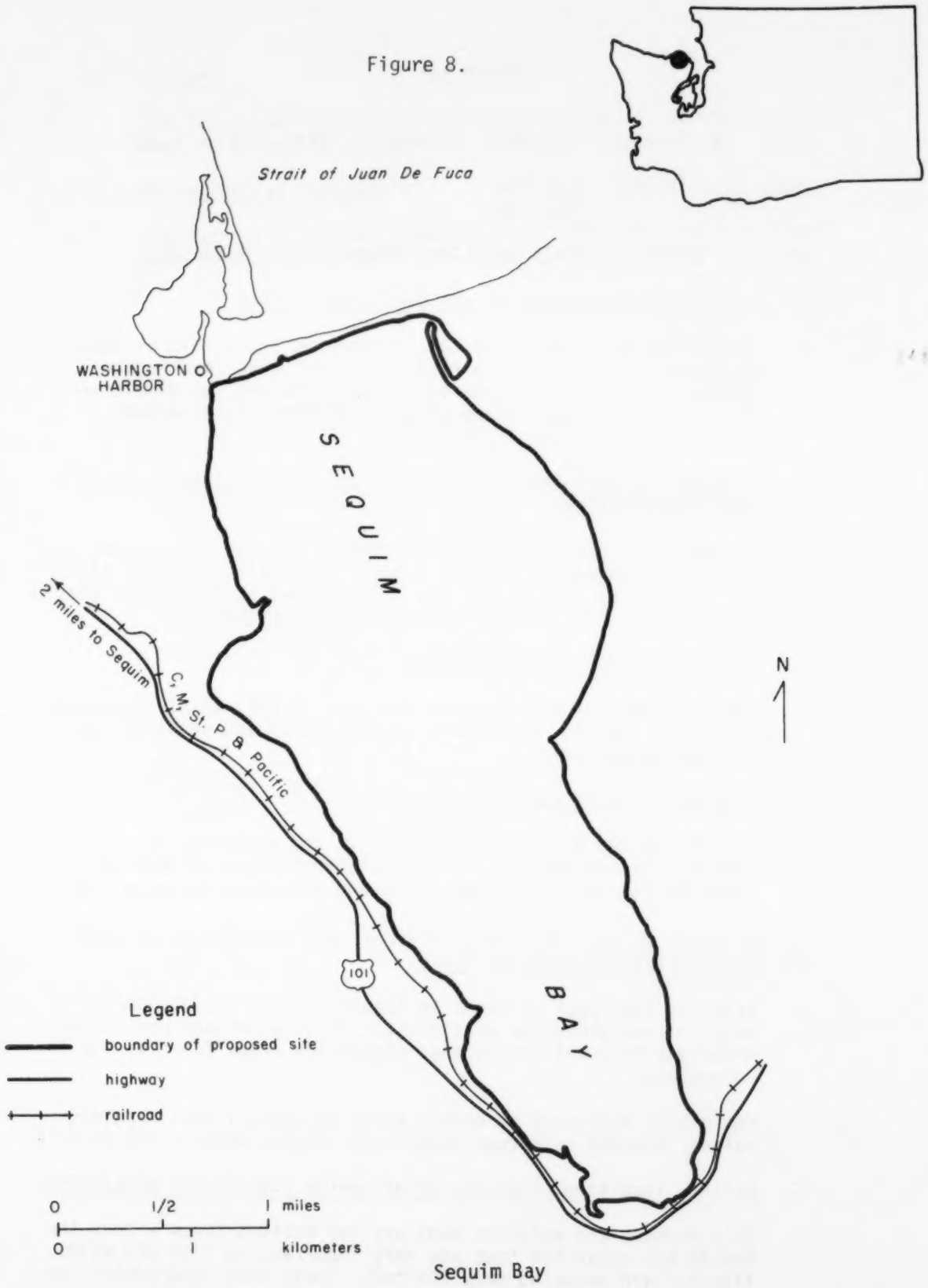
Eelgrass beds such as those in Sequim Bay are rapidly becoming very limited along the west coast. These sites are particularly important to brant and as food production areas for fish and invertebrates.

The bay is also used by harbor seals (a state listed species), salmon, sea-run cutthroat trout, cod, clams, oysters and mussels.

F. Relict, localized, limited, or otherwise significant ecosystems

Salt marshes and eelgrass beds are two habitat types within the Sequim Bay ecosystem that are very important to fish and wildlife but are becoming very limited. Their continued protection is of special concern.

Figure 8.



Sequim Bay

III. THREAT OF DESTRUCTION/DEGREE OF PROTECTION

A. Nature of threat and probability of occurrence within two, five, or ten years

The development of Sequim Bay shoreline for homesites is ongoing. As the Pacific Northwest continues to grow this development can be expected to accelerate.

The greatest threat presently is a proposal for a 700-1,000-boat marina in the bay. Other threats include commercial hydraulic harvesting of hardshell clams, log rafting in intertidal and salt marsh areas, and increased human disturbance by boaters and water skiers.

B. Severity of impact and permanence of change

Most of the threats mentioned above would adversely impact fish and wildlife populations. Some of these impacts would be permanent but others, like log rafting, are temporary or long term.

C. Degree of protection

The shoreline and the bay itself are protected by numerous laws and regulations prohibiting adverse dredging and filling activities in these wetlands. These measures are partially successful in preserving such areas.

IV. ECOSYSTEM DESCRIPTION

A. Land use (agriculture, tree farms, suburban lands, etc.)

Most of the area of concern is intertidal and subtidal mudflats and adjacent shorelines, and is still undisturbed.

B. Physical description (geology/soils, topography, climate)

Sequim Bay has a total volume of 145,000 acre-feet of water at high tide. A few small creeks drain into the bay.

Topography of the bay is flat, but the adjacent watershed rises sharply to the crest of the Olympic Mountains in Olympic National Park.

The climate is mild. Located in the rainshadow of the Olympics, precipitation is usually less than 20 inches per year.

C. Vegetation/habitat and estimated acreage

Eelgrass and several algal species occur in the bay. Saltmarsh areas are predominantly vegetated by pickleweed and saltgrass. Alder and mixed conifer forests cover the upland sites.

V. OWNERSHIP INFORMATION

Type of Ownership	No. of Ownerships	Residences	Acres	Cost Est.
State	Several	0	Unknown	
Private	Several	0	Unknown	

VI. OTHER AVAILABLE INFORMATION

A. Identified by others as an area of concern

The area has been given strong local support by the land owners of the bay who oppose marina development. Local Audubon groups also favor protection of the bay in its natural state.

B. Other available information (publications, reports, etc.)

Additional information is available from the U.S. Fish and Wildlife Service, Area Office, Olympia, Washington.

VII. ADDITIONAL COMMENTS

A. Controversial aspects related to the site

Any efforts to stop development will be opposed by some of the local residents; however, the prevailing sentiment of the area seems to favor some sort of protection of the bay for its natural and scenic values.

B. Availability

Unknown.

C. Possible alternative measures for protection

Designation of the bay as a state marine park or reserve or wildlife refuge are all possibilities for protection. Easements with landowners is another viable strategy.

D. Estimated annual operational/maintenance expenditures

Unknown.

E. Development needs

Unknown.

F. Recreational and/or environmental education potential

The bay has outstanding opportunities for fish and wildlife oriented recreation, education, and scientific study. Hunting, fishing, boating, shellfish gathering, interpretation, environmental education, and wildlife observation opportunities are all available on the bay.

G. History

Unknown.

H. Archeological information

Unknown.

MCNEIL AND GERTRUDE ISLANDS

I. STATE: Washington COUNTY: Pierce ACRES: 4,400

LEGAL DESCRIPTION: T20 R1E, Sections 8, 9, 14, 15, 16, 17, 19, 20, 21, 22, 23, 26, 27, 28, 29

II. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

A. Reason for uniqueness or national significance

McNeil Island has been operated as a penitentiary for over 100 years, both as a territorial prison and a federal prison. During this time, development and public disturbance have been minimal.

Because of its protective status the island has served as a wildlife sancturay or an "island of habitat" surrounded by a large and rapidly expanding metropolitan area where wildlife and their habitat are being lost continually through development.

B. Endangered, threatened, or endemic species (including plants and invertebrates)

A pair of bald eagles nest on Gertrude Island, located just off McNeil Island in Still Harbor. A few bald eagles also winter in the area.

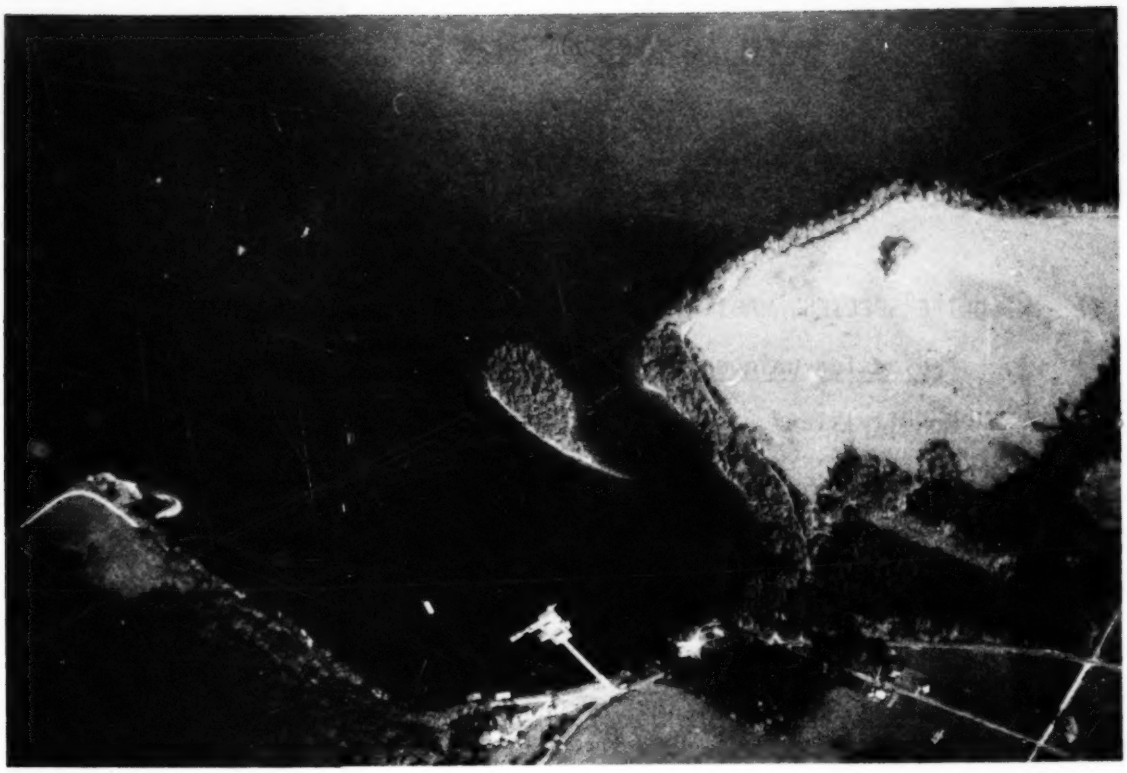
There are no known plant or invertebrate species listed as threatened or endangered on the island; however, a thorough survey has not been done.

C. Species abundance and diversity

McNeil Island represents a diverse mix of marine, intertidal, freshwater grassland, and woodland habitats that support equally diverse plant and wildlife populations. A complete bird list is not available but the nearby Nisqually National Wildlife Refuge has recorded over 100 species. Most of these birds also occur on McNeil Island.

Over 10,000 waterfowl winter in the immediate area. A freshwater reservoir is used by waterfowl for resting and feeding during stormy weather and the hunting season.

Mammal populations include harbor seal, black-tail deer, coyote, raccoon, and several smaller species. Intertidal flora and fauna are abundant.



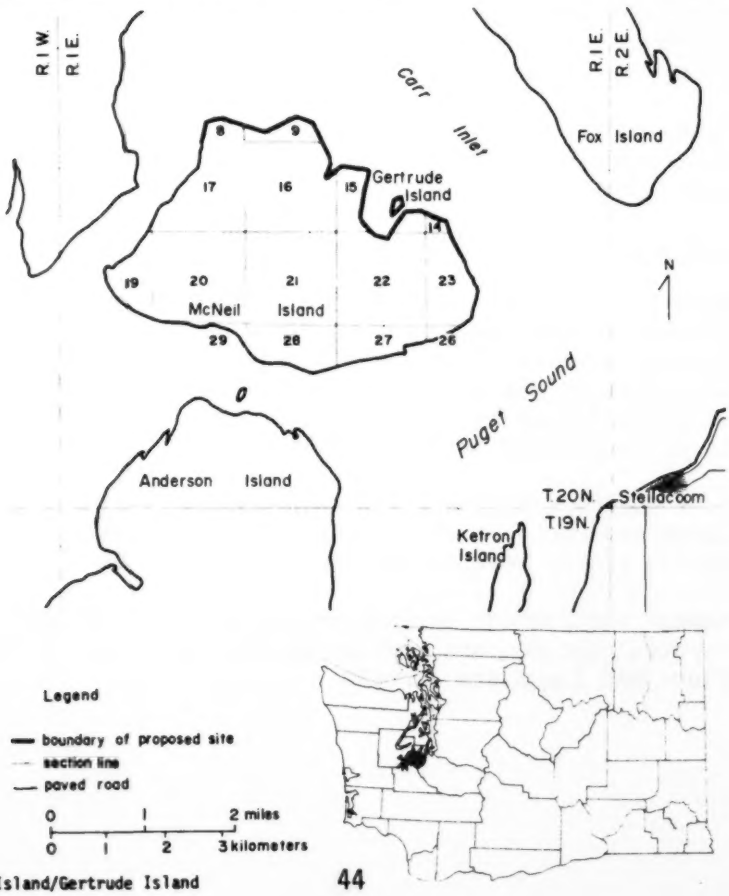


Figure 9. McNeil Island/Gertrude Island

D. Species of major concern and reasons

The bald eagle is now listed as a threatened species in Washington. Active nest sites such as that found on Gertrude will probably be identified as critical habitat and is certainly an area of concern.

Still Harbor supports the last remaining harbor seal pupping and hauling out ground in south Puget Sound. Expanding human populations, shoreline developments, harassment (including shooting) by boaters, fishermen, etc., have reduced Puget Sound seal populations and forced them to the last sanctuary in the area. McNeil Island is probably critical for the continued survival of the harbor seal in south Puget Sound.

E. Wildlife values, including different and outstanding wildlife associations and habitat types

McNeil Island has a great blue heron rookery of 74 pairs. These birds feed throughout the area, including the Nisqually Refuge to the south.

The intertidal zone is especially unique because of its richness in species diversity and abundance but also because it has not been disturbed by humans. This habitat remains much as it did 100 years ago, which in the Puget Sound area is a rarity.

F. Relict, localized, limited, or otherwise significant ecosystems

Large, undisturbed island ecosystems are very limited on the west coast and within the Puget Sound are becoming scarce as more islands are developed for homesites.

Salt marshes and undisturbed intertidal areas are also becoming limited.

III. THREAT OF DESTRUCTION/DEGREE OF PROTECTION

A. Nature of threat and probability of occurrence within two, five, or 10 years

The Justice Department has recently indicated the possibility of phasing out the McNeil Island penitentiary and excessing the property.

At the present time, it looks very likely that such actions would take place in 1980. Depending on the ultimate outcome of this land transfer, any major change in land use or management could have severe impacts on the wildlife of the island.

B. Severity of impact and permanence of change

Interest has been shown in developing McNeil Island for industry (possibly a nuclear power plant), recreational and residential homesites, a marina, and a state or county park.

Any large scale development or the opening of the island to large numbers of people could negatively impact sensitive species such as nesting bald eagles and harbor seals.

C. Degree of protection

Shoreline and wetland areas are protected by a wide variety of local, state, and federal laws and regulations that have been only moderately successful in preserving these habitat types. Very little protection other than building codes and zoning ordinances protect the upland sites.

IV. ECOSYSTEM DESCRIPTION

A. Land use (agriculture, tree farms, suburban lands, etc.)

McNeil Island covers approximately 4,400 acres. Land use and habitat types are roughly estimated as follows: orchard (200 acres), freshwater reservoir (150 acres), pasture/croplands (820 acres), freshwater marsh (30 acres), forest (2,800 acres), sand and gravel beach (200 acres), salt marsh (30 acres), and buildings and grounds (200 acres).

Logging has occurred over the entire island but in general, disturbance to the area has been minimal.

B. Physical description (geology/soils, topography, climate)

McNeil Island is located in Puget Sound directly west of Tacoma. The topography of the island is low rolling hills. Elevations range from sea level to 280 Feet. Climate is moderated by warm, moist marine air. Precipitation ranges from 40-55 inches per year.

C. Vegetation/habitat and estimated acreage

McNeil Island is covered by a mixed forest of Douglas fir, alder, and western hemlock. Understory species include red huckleberry, sword fern, and red elderberry. Stands of Pacific madrone are occasionally present.

Open fields and freshwater marshes are scattered over the area. Salt marshes rim the islands and are vegetated with

salt grass and pickleweed. Intertidal areas include several algal species.

V. OWNERSHIP INFORMATION

Type of Ownership	No. of Ownerships	Residences	Acres	Cost Est.
Federal	1	54	4,400	None

VI. OTHER AVAILABLE INFORMATION

A. Identified by others as an area of concern

McNeil Island has been identified as an area of concern by the Tahoma and Seattle Audubon Societies, Federation of Western Outdoor Clubs, and the Washington Environmental Council.

B. Other available information (publications, reports, etc.)

Additional information is available from the U.S. Fish and Wildlife Service, Area Office, Olympia, Washington.

VII. ADDITIONAL COMMENTS

A. Controversial aspects related to the site

Many local interests would like to see the island opened to recreation and development. Any effort to preserve or further restrict public use and entry on the island will probably be opposed by these interests.

Disposition of this property has become a gubernatorial campaign issue, with some favoring use as a State park and wildlife sanctuary, others favoring use as a State prison. Heirs to the original landowners are pressing for return of the land to them.

B. Availability

The land will probably be made available within the next year through the federal excess property listing process.

C. Possible alternative measures for protection

Shoreline areas could possibly be protected by a state marine park designation. Upland sites could also be protected as state or county parks, green belt or "preserve" zoning. National Wildlife Refuge or Wildlife Recreational Area status are also viable options. One small building on the penitentiary complex could possibly qualify for historical preservation along with several residences on the island. Some sites, especially Still Harbor and some of the shoreline areas, could qualify as research natural areas.

D. Estimated annual operational/maintenance expenditures

Depending on the degree of public use, expenditures could range from $150,000 to $250,000 annually.

E. Development needs

Recreational and public use facilities would have to be built if those activities were included in the future management plan of the island.

F. Recreational and/or environmental education potential

The potential for a wide variety of recreational and educational activities is great.

G. History

Settlement of the island dates back to 1853. The island has had a penitentiary on it since 1870. Several existing houses on the island are being considered for inclusion on the national register of historic sites.

H. Archeological information

Several archeological sites are being evaluated for inclusion on the national register of archeological sites.

POINT NEW

I. STATE: Washington COUNTY: Grays Harbor ACRES: 348

LEGAL DESCRIPTION: Sec. 2 T17N, R11W, Sec 35, 36, T18N, R11W

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

Point New is an unspoiled part of Grays Harbor on Washington's coast. The area is unique because of the remarkable diversity of habitats present within a small area.

Peregrine falcons winter in the area. Merlins regularly hunt at the site. Bald eagles are seen infrequently.

Over 100 species of birds are found regularly at Point New including many waterfowl and shorebirds. Brant geese regularly use the gravel beaches of the site. Mammals using the area include black-tail deer, Roosevelt elk, bobcat, raccoon, coyote, and several smaller species.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

The site is not under immediate threat of development; however, it seems very likely that the area will be developed, especially as the urban features of Aberdeen and Hoquiam approach more closely. The principal landowner proposes to sell for development purposes.

C. ECOSYSTEM DESCRIPTION

Point New is seven miles west of Hoquiam at the mouth of Grass Creek. The site contains mudflats (20 acres), beaches (40 acres), brackish and freshwater marshes (40 acres), low salt marsh (10 acres), wooded swamp (30 acres), conifer and deciduous forest (110 acres).

Elevation varies from below sea level to 120 feet in the upland bluffs. In some areas the uplands drop abruptly to the bay creating 30 ft. cliffs.

Dense stands of eelgrass occur in the mudflats. Marsh areas are vegetated by bulrush, seaside arrowgrass, Canada sandspurry, saltgrass, pickleweed, sedges, reed canarygrass, and spike rush. Upland vegetation includes willow, alder, Douglas

fir, and Sitka spruce. Understory vegetation is varied and typical of western Washington.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Private	5	1	348

IV. ADDITIONAL INFORMATION

The site has been identified by the Washington Department of Game and the Grays Harbor Bird Club as an area of concern. Additional information is available from the U.S. Fish and Wildlife Service, Olympia, Washington.

Controversy regarding preservation should be minimal. Recreational and environmental potential of the site is high.

There are no known historical or archeological resources in the area.

JUNIPER WOODS

I. STATE: Washington COUNTY: Franklin ACRES: 8,500

LEGAL DESCRIPTION: T1ON, R32E

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

The Juniper Forest is one of the few unaltered areas of steppe vegetation in Washington State and contains the northernmost stand of western juniper in North America. The active sand dunes are part of a desert ecosystem unique to Washington, providing habitat for species rarely found in this State, including the ferruginous hawk, Ord's Kangaroo rat, longbilled curlew and pygmy rabbit. Up to 10 of the 25 breeding pairs of ferruginous hawks in Washington nest here.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

An increasing number of off-the-road vehicles use the area, causing erosion and plant destruction. The Bureau of Land Management which controls most of the Juniper Woods is considering declaring this area as wilderness, which would preclude use by ORV's. Recent indications are that the area will not be designated, however managing ORV's could be accomplished by BLM even without a wilderness declaration.

C. ECOSYSTEM DESCRIPTION

The Juniper Woods is within the Pasco basin of southeastern Washington, located on a sand dune complex northeast of the junction of the Columbia and Snake Rivers. The basin's steppe and shrub-steppe vegetation is dominated by grasses and forbs or sagebrush. Western juniper is associated with the moving dunes, while a few isolated individuals are found along river bottoms. Dunes reach a height of 120 feet and move in the direction of prevailing winds toward the northeast. Mean annual precipitation is approximately 7 inches.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Federal (Bureau of Land Management)	1	0	8,500

IV. ADDITIONAL INFORMATION

Detailed information on the area may be obtained from the Bureau of Land Management in Spokane and the Seattle Audubon Society.

BOWERMAN BASIN

I. STATE: Washington COUNTY: Grays Harbor ACRES: 540

LEGAL DESCRIPTION: Sec. 3, 4, 5, 8, 9, 10, T17N, R10W

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

Grays Harbor is the northernmost major sheltered bay on the coast of North America south of Alaska. The bay is used by 30 species of waterfowl and 20 species of shorebirds.

Grays Harbor probably winters the largest number of dunlin in North America. Ninety-five thousand dunlin were counted in Grays Harbor in December, 1976.

Bowerman Basin is a sheltered area of Grays Harbor especially attractive to shorebirds. Up to 50,000 dunlin have been recorded there. Peregrine falcons and merlins regularly use the site to feed on shorebirds. The 16 merlins that were counted in 1977 was the highest number for any Christmas Bird Count in North America that year.

Species of interest that use the area are Brant geese, bald eagles, snowy and semi-palmated plovers, and possibly a disjunct population of burrowing owls. The basin is of major importance to shorebirds and raptors.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

The major threat to the site is from filling and industrial development. The area has already been identified by the Port of Grays Harbor for that purpose. Such impacts would be severe and permanent.

C. ECOSYSTEM DESCRIPTION

The Bowerman Basin is on the north shore of Grays Harbor approximately one mile west of the City of Hoquiam. The site consists of 450 acres of tidelands, 90 acres of salt marsh/grassland, and 10 acres of deciduous forest. Half Moon Island and the west end of Bowerman Airfield are mostly sandy sediments and beaches.

Vegetation in the salt marsh has developed on dredge materials. Plant diversity is low and includes pickleweed, saltmarsh

sandspurry, and seaside arrowgrass. Sedges, willow, alder, some grasses, and forbs occur in the higher sites.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Port of Grays Harbor	1	0	540

IV. ADDITIONAL INFORMATION

The site has been identified by the Washington Department of Game, Grays Harbor Bird Club, Black Hills Audubon Society, and private individuals as a site of concern. Additional information and publications on the site are available from the U.S. Fish and Wildlife Service in Olympia, Washington.

Efforts to preserve the site would be very controversial. Local opposition would be great.

The site is well suited for most nonconsumptive wildlife activities. Waterfowl hunting occurs on the site and some public hunting could be allowed if controlled.

There are no known historical or archeological resources at the site.

GRAYSMARSH FARM

I. STATE: Washington COUNTY: Clallum ACRES: 850

LEGAL DESCRIPTION: T30, R3W, Sec. 4, 9

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

Graysmarsh Farm is an area of rich and diverse habitats for fish and wildlife. Species of particular concern include peregrine falcons, bald and golden eagles, osprey, and Brant geese. The area is used heavily for staging, feeding, and breeding of 20 waterfowl species including canvasback, whistling swan, wood duck, and harlequin duck.

The area is used by sea run cutthroat trout and coho salmon and a diversity of marsh and woodland mammals. Tidelands support an abundance of mollusks and crustaceans and an eelgrass-kelp association which functions as an important nursery for juvenile cottids and salmonids. Local populations of harbor seals use shoals as a haul-out area.

Many species of shorebirds and colonial nesters including great blue herons, cormorants, grebes, and pigeon guillemots use the area. Sandstone cliffs 80-100 feet high are used for nesting. Grouse, quail, pheasant, and Chilean tinamou are also present.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

Preservation of natural values and isolation have always been major themes of the owner. Current management is concentrated upon continuing these policies. The marsh interior as well as all woodlands are maintained and managed as a wildlife refuge.

There are no immediate threats to this site; however, surrounding farmlands are being developed for homesites at a rapid rate and suitable wildlife habitats, especially wetlands, are declining. Upland logging may affect runoff patterns and aquatic productivity. There is evidence that commercial harvesting practices for geoducks is negatively impacting the intertidal areas.

C. ECOSYSTEM DESCRIPTION

The Graysmarsh Farm is approximately 850 isolated acres on the Strait of Juan de Fuca including coastal marsh, tidelands,

shoreline cliffs, woodlands, freshwater sloughs and streams, numerous springs, a freshwater lake, and croplands that support high levels of production and diversity. The area is relatively undisturbed and protected.

Lowland marsh areas are vegetated by cattails, bulrush, sedges, smartweed, pondweed, and saltgrass/pickleweed associations. There are fragile dune and bluff associations and prolific marine algae communities. Marshes lie in the upper intertidal zone and grade upwards to croplands. Elevations range from 0-30 feet.

Timber and lake habitats range in elevation from 50-150 feet on rolling land. The major upland sites are vegetated with Douglas fir/grand fir with understory of red huckleberry and ocean spray. Lowland sites are vegetated with red alder, big leaf maple, willow, elderberry, and blackberry.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Private	1	1	850

Land use can be classified as follows: timber (400 acres), cropland (40-60 acres), marsh (250 acres), tidelands (150 acres), lake (2 acres). Total cost is unknown.

IV. ADDITIONAL INFORMATION

Numerous groups have expressed interest in the area, including the Nature Conservancy, Olympic Peninsula Audubon Society, and various State agencies including the Department of Game, Fisheries, and Natural Resources. Numerous reports, publications, photographs, and files for 1941 to date are available on the property.

The area has great potential for wildlife observations, interpretation, scientific study, environmental education, and controlled public hunting. Many plant associations and habitats are extremely fragile and public use in these areas would have to be restricted.

Potential for waterfowl management is enhanced by controllable water levels and numerous springs. Grain fields are currently farmed to provide food for migratory waterfowl.

KAH TAI LAGOON

I. STATE: Washington COUNTY: Jefferson ACRES: 100

LEGAL DESCRIPTION: T30N, R1W, Sec. 2

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

Kah Tai Lagoon represents a diverse mixture of wildlife habitats in an urban setting. Fifty-one species of birds including many waterfowl and marsh species use the area. Bald eagles and snowy owls also use the area.

Many of these species are summer residents, using the area for nesting and feeding. Raccoon, fox, rabbit, and muskrat are also present.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

The lagoon lies within the town of Port Townsend. Present landowners have plans to fill and develop the site into a shopping center and condominiums as soon as possible.

The area has been designated as park and open space by the Port Townsend Comprehensive Plan. Petitions to rezone 16 acres of the area to commercial uses have been filed, but is presently stayed by litigation. Development demands on the land are expected to continue in the future.

C. ECOSYSTEM DESCRIPTION

The lagoon is comprised of 30 acres of shallow salt-brackish water lagoon, 20 acres of surrounding marsh, 40 acres of grasslands, and 10 acres of woodlands.

The marsh is dominated by hardstem bulrush, cattail, rushes, saltgrass, and seacoast bulrush. Shrub thickets are densely vegetated with giant knotweed, blackberries, rose, and poison hemlock. The grasslands are vegetated by grasses, Scotch broom, wild currant, blackberries, and wild rose. The woodlands are dominated by popular, willow, crab apple, and apple trees.

The topography is best described as a sea level basin. Elevations do not exceed 25 feet.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Public	4	0	Unknown
Private	Several	0	Unknown

IV. ADDITIONAL INFORMATION

Port Townsend is a National Landmark and some local residents feel that the lagoon adds to the overall integrity, heritage, and scenic beauty of the area.

The lagoon has been identified as an area of concern by the Admiralty Audubon Society, Earth Care Organization, Northwest Fund for the Environment, Kah Tai Alliance, Protect the Peninsula's Future, Ohode, Seattle Shoreline Coalition, Washington State Department of Archeology and Historical Preservation and Washington Environmental Council.

Additional information is available from the U.S. Fish and Wildlife Service, Olympia, Washington, and in the following publications: Ecological Community Survey - Kah Tai Lagoon, 1976; Water Street Historic District, Port Townsend, Washington, 1975; Department of Ecology Coastal Zone Habitat Atlas, American Preservation, 1978.

The Kah Tai Lagoon is a controversial local issue. Despite designation as a park and open space, the area is still receiving pressure for development. Management scenarios are basically nonconsumptive and include interpretation, education, wildlife observation, and scientific study.

DEER LAGOON (USELESS BAY)

I. STATE: Washington COUNTY: Island ACRES: 400

LEGAL DESCRIPTION: T29N, R2E, Sec. 24

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

Deer Lagoon is considered by many, including the Department of Game, to be the most important site on Whidbey Island for migrant waterfowl use. Brant geese, and trumpeter swans use the area for migration and wintering.

Total avifauna diversity approaches 100 known species including wintering bald eagles, eight other raptor species, and a wide variety of marsh and shorebirds. Ten mammal species are known to occur at the site.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

The site falls under the purview of the Coastal Zone Management Act and a variety of regulatory statutes that limit developmental activities in coastal wetland areas. However, because ownership is private, there is a great amount of pressure to develop the site.

Potentials for development include filling for homesites and the development of a marina. Langley Port District Commissioners have asked (1977) the U.S. Corps of Engineers to study the feasibility of a marina with a capacity of 400-500 boats.

C. ECOSYSTEM DESCRIPTION

The site includes a variety of habitats including intertidal mudflats, salt marsh, brackish and freshwater marshes, wet meadows, upland grasslands, and adjacent forest habitats. The area is diverse in plant species and is unique because it is relatively untouched by development or alterations of any kind.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Private	1	0	400

IV. ADDITIONAL INFORMATION

The Department of Game and the U.S. Soil Conservation Service in a survey of wetland resources of northwestern Washington have declared Deer Lagoon "critical" to the needs of migratory waterfowl on Whidbey Island.

Additional interest in protecting the area has been expressed by SWIFT (Save Whidbey Island for Tomorrow). Further information on the site is available in Environmental Impact Statement No. 0777 - Island County Planning Department.

The owner is known to be persistent in his efforts to develop the site. Efforts to protect the site will probably meet with opposition and some local controversy.

The area is now limited to private hunting but it does have potential to be managed as a limited public hunting area for waterfowl. Scientific study, wildlife observation and interpretation, and environmental education are all potential compatible uses of the area.

UNION RIVER ESTUARY (LYNCH COVE)

I. STATE: Washington COUNTY: Mason ACRES: 340

LEGAL DESCRIPTION: T23N, R1W, Sec. 29, 30, 31, 32

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

The area is the last remaining estuary on the extreme east arm of Hood Canal. It is an important source of food and shelter for all the fish, shellfish, and wildlife that use the area.

The area is a nesting, resting, and feeding area for a wide variety of birds including osprey, bald eagles and other raptors, various waterfowl, shorebirds, and many species of wading and water birds.

Mink, otter, weasel, red fox, and other small mammals use the area. The estuary is a spawning and feeding area for sea run cutthroat trout and steelhead.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

Housing and recreational development has caused several fills on North Shore of Lynch Cove during the past 20 years. Sudden growth of the Trident Support Site in Kitsap County has caused increased pressure for development of the estuary. Recent inquiries for development of the estuary include filling for a mobile home park, community ball fields for the school district, and homesites on the bay. Pressure to develop is immediate and will increase in the future.

C. ECOSYSTEM DESCRIPTION

The estuary is typical of the few that are remaining in the Puget Sound. Topography is flat with elevations ranging from below sea level (mud flats) to raised areas of a few feet above sea level (salt marsh).

Rushes, sedges, and saltgrass are predominant in the salt marsh. Some cedar, alder, and cottonwood occur in the surrounding areas of higher elevations.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Private	Several	0	1
State Game Dept.	1	0	Unknown
School District #403	1	0	70*

*Seventy acres of the estuary were willed to the North Mason School District for recreational development. Total acreages are classified as follows: salt marsh (200 acres), freshwater wetland (100 acres), and farmland (40 acres).

IV. ADDITIONAL INFORMATION

Local Audubon Societies, Washington Environmental Council, Hood Canal Environmental Council, Mason Regional Council, and the State Game Department are all aware of the need to preserve this area. The U.S. Fish and Wildlife Service in their document Hood Canal - Priorities for Tomorrow, 1974, lists the Union River estuary as an area of concern. Additional information is available in Hood Canal Project Report, 1972 by The Evergreen State College, the Mason County Planning Department, and articles in the Mason County Journal.

The area has easy access for public recreation and education purposes. Scientific study and wildlife observation would be ideally suited for the area.

Early settlers diked much of the estuary in the late 1800's to farm the lowlands. These dikes have deteriorated and much of the salt marsh has returned to its natural state.

The site may have archeological resources. An Indian village site is located on the Belfair State Park, three miles away.

CROCKETT LAKE

I. STATE: Washington COUNTY: Island TOTAL ACRES: 200

LEGAL DESCRIPTION: T31N, R1E, Sec. 14, 15

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

Crockett Lake is a unique wildlife habitat supporting 124 known species of birds. Species of special interest include bald eagles, osprey, snowy owls, and a wide variety of waterfowl and shorebirds. Migrant waterfowl using the lake during the fall and winter months number in the "thousands". Adjacent forests and farmlands provide diverse habitats and unusual "edge effects".

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

The area is under extreme pressure to develop "spit" and lakeshore homesites that would essentially destroy most of the scenic, recreational, educational, and wildlife values of the area. Marina development and wetland drainage are also potential threats to the natural integrity of the area.

C. ECOSYSTEM DESCRIPTION

Crockett Lake is a brackish wetland 1-1/2 miles long, separated from Admiralty Inlet by the narrow (600') Barrier Beach ("spit") which is 9,000 feet long. The lake varies in size from 350-500 acres depending on rainfall. In the late 1940's a drainage district reduced the lake to about 10 acres and the lake bottom was farmed. In 1974 tide gates failed and the lake has filled in since.

The area is part of the Central Whidbey Island Historic District, located on State Scenic Highway, adjoining Fort Casey Historic Park and Underwater Park. Crockett Lake provides a unique scenic vista of marsh life to hundreds of thousands of tourists annually. Accessibility to the area is excellent and public use is heavy.

The marsh areas are vegetated with bulrush, Baltic rush, salt grass, seaside arrowgrass and horsetail. The adjacent forests are dominated by Douglas-fir and Sitka spruce. Transitional habitats are vegetated by red alder, willow, Oregon grape, wild rose, and gooseberry. Rainfall averages 18 inches and topography is of low relief.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Private	Several	0	200

IV. ADDITIONAL INFORMATION

The Department of Game and the Soil Conservation Service have identified Crockett Lake as "critical habitat" in their wetland survey of northwestern Washington. Other groups that have expressed a concern for the area include: Seattle Audubon Society, Washington Environmental Council, The Mountaineers, Seattle Pacific College, Scuba Divers, and SWIFT (Save Whidbey Island for Tomorrow).

A 1975 Washington State Supreme Court decision invalidated a proposal to develop 182 homesites on Keystone Spit. Additional information is available in Environmental Impact Statement, Seabreeze Development, Island County Planning Department.

The area has excellent potential for wildlife observation, interpretation, environmental education, and scientific study. Annual operation and maintenance costs could be extensive because of high public use in the area.

RENTON MARSH

I. STATE: Washington COUNTY: King ACRES: 2,200

LEGAL DESCRIPTION: T34N, R5E, Sec. 19

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

This area is one of the few marshes left in the highly developed Seattle metropolitan area. A diversity of habitats supports 69 recorded species of birds including many waterfowl, raptors, woodpeckers, and passerines. Among the nesting species are American bittern, green heron, Canada goose, and wood duck. Bald eagles have also been sighted in the marsh. Ten mammal species have been recorded.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

Renton Marsh land is zoned manufacturing industrial. Pressures to fill and develop the site are immediate. A road is presently being constructed through the site which requires much filling of wetlands. There are several plans for filling and development including those supported by the City of Renton and many of the owners.

C. ECOSYSTEM DESCRIPTION

Renton Marsh is a remnant of a former and much larger wetland environment of the lower Green River Valley. The site is comprised of freshwater marshes, ponds, drainage creeks, grasslands, and wooded uplands.

Lowland sites are vegetated with typical wetland species such as cattail, rushes, and sedges and the uplands are dominated by an overstory of black cottonwood and alder. Predominate understory includes grasses, forbs, and blackberry. Snags and dense brush thickets increase the habitat diversity of the area.

Topography is flat valley bottomlands. Elevation is approximately 50 feet.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Private	9	unknown	2,200

IV. ADDITIONAL INFORMATION

The site has been identified by the Rainier and Tahoma Audubon Societies, the Nature Conservancy, and the Soil Conservation Service as an area of concern. Additional information is available in "City of Renton, Green River Valley Wetlands" study report and in the 1976 Soil Conservation Service report entitled, "Long-term effects of the watershed projects and subsequent development on wildlife in the Green River Valley within the City of Renton."

The sites would be suitable for a state or local park and most forms of nonccnsumptive wildlife activities such as interpretation and education would be compatible with the area.

BLACK RIVER SWAMP

I. STATE: Washington COUNTY: Thurston ACRES: 775

LEGAL DESCRIPTION: Sect. 12, 13, 24, 25 T17N, R3W; Sec. 7, 18 T17N, R2W

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

The Black River Swamp lies within the drainage where the Pacific mudminnow (Novumbra hubbsi) occurs. The swamp represents ideal, undisturbed habitat for this species which many feel deserves classification as threatened or endangered. Actual occurrence of the fish in this area has not been verified, but it is highly probable that it does occur.

Species diversity and abundance is not particularly great because the habitat is similar, although unique. Common species include river otter, beaver, mink, wood ducks, and hooded mergansers. The swamp is probably the most consistent area in the state where green heron occur. The green heron probably nests in the swamp.

The swamp is considered one of the finest untouched lotic environments in Washington.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

The Black River Swamp is one of two areas in Thurston County designated "natural" in the shoreline management program.

The primary threat to this area is from land development. The site is located only a few miles south of Olympia, an area that is rapidly expanding especially in suburban areas. The only thing that has protected the site so far has been the major obstacle involved in draining the site.

Other threats include logging and wood cutting in adjacent woodlands, proposals for a navigation channel from Grays Harbor up the Chehalis and Black Rivers, and water pollution from upstream homeowners and recreationists on Black Lake.

C. ECOSYSTEM DESCRIPTION

The Black River Swamp is a wide (0.6 mile) area of low relief where the Black River slowly meanders through an unspoiled area of willow bottoms for approximately four miles. Beaver dams are numerous and obstruct the river flow in approximately 20

locations. It is the most extensive area of its kind in the state. Major habitats include river courses, ponds and oxbows, freshwater marshes, and willow thickets.

The substrate consists of alluvial deposits of silt and sand over which has accumulated much organic matter. Organically rich muck and peat soils are prevalent. Peat soils extend to depths of 4 feet over much of the area and up to 20 feet in some isolated areas.

The area is heavily vegetated. Submergent aquatics such as pondweeds, coontail, bladderwort, and spatterdock are prevalent throughout the watercourses and ponds. Adjacent emergent aquatics include cattail, sedges, reed canarygrass, and bulrush. The dominant plant cover in the swamp is willow, with red alder, creek dogwood, Oregon ash, and western crabapple occurring on the drier sites. Adjacent lands are covered with typical mixed conifers of western Washington.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Private	14	few	745
Corporate	1	0	30
			775

IV. ADDITIONAL INFORMATION

Any controversy over the site would develop from advocates of residential development. Because of the great difficulty in draining and channeling the area, this controversy should not be significant.

The Black River Swamp is little known to most people and subsequently it has not been identified by many major groups. Its recognition as a "natural" area under the Shoreline Management Act is a result of the concern of a few conservationists who know the area.

The area has tremendous potential for noncomsumptive uses such as wildlife observation, interpretation, scientific study and canoeing. The aesthetic values of the area are very high. Alternative preservation strategies could include state or county parks.

There are no known archeological or historical resources in the area. Additional information is available from the U.S. Fish and Wildlife Service in Olympia, Washington.

TUKWILA POND (CITY LIGHT POND)

I. STATE: Washington COUNTY: King ACRES: 38.8

LEGAL DESCRIPTION: T34N, R4E, Sec. 26

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

Tukwila Pond is the last pond left in the Green River Valley north of Kent. It is a relict of a once extensive wetland that was used widely by migratory birds and many terrestrial species.

The area is presently used by a variety of waterfowl and associated marsh birds, e.g. great blue herons, and is extremely important as a resting and nesting area for these birds which feed in the pond and surrounding agricultural lands. Dead snags and brush provide habitat for woodpeckers, raptors, and passerine birds. A tract of highly valuable wildlife habitat in urbanized King County is rare.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

Located in the middle of a highly developed industrial/business area, the pond is under extreme pressure to be filled for a construction site. This threat is immediate. The area is zoned industrial.

C. ECOSYSTEM DESCRIPTION

Approximately 20 percent of the area is pond, the remaining acres are a grass field with low depressions and alder and blackberry thickets. The pond is bordered by dead snags, alders, and willows with an understory of blackberry.

Freshwater marsh vegetation includes reed canarygrass, cattail, rushes, and spike rushes. The topography is flat river bottom land with elevations to 25 feet.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Municipal	1	0	38.8

IV. ADDITIONAL INFORMATION

The Department of Game, City of Tukwila, and the Seattle Audubon Society have all expressed interest in preserving the area for wildlife habitat. Additional information is available in "Seattle City Light - Tukwila Pond Fill Proposal - Final EIS", issued May 1976 through the City of Tukwila Planning Department.

The greatest potential of the area lies in providing a sanctuary for wintering and migrant waterfowl and as a nonconsumptive wildlife use area for the public. Activities would be limited primarily to wildlife observation and possibly environmental education.

FISHER ISLAND

I. STATE: Washington COUNTY: Cowlitz ACRES: 186

LEGAL DESCRIPTION: Sec. 21, 22, T8N, R3W

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

The primary importance of this site is derived from the presence of a large great blue heron rookery on the island. In 1978 an estimated 350 nests were in the rookery making it one of the largest in the Pacific Northwest. Production estimates range in excess of 750 young annually.

The "riparian black cottonwood/willow along the lower Columbia River" has been listed as a special habitat type lacking adequate representation as a Research Natural Area in 1975.

The habitats of the island and adjacent river system are diverse but knowledge of bird and mammal species is limited. Numerous waterfowl, shorebirds, and an occasional bald eagle frequent the island in winter months. Canada geese and red-tailed hawks nest on the island.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

There are plans for an industrial port on the adjacent mainland. A state marine park is under consideration on Hump Island, which is contiguous with Fisher Island at the east end. Dredge materials from the Columbia River navigation channel may be deposited in the lagoon between Fisher and Hump Islands. Plans of the owner are unclear but development of some sort appears probable.

Great blue herons are sensitive to human disturbance and any of the above activities would probably jeopardize the integrity of the rookery.

C. ECOSYSTEM DESCRIPTION

Fisher Island lies 38 miles from the Columbia River mouth. It is separated from the Washington mainland by a 250 yard wide channel.

There are four major habitat types on the island. Open forb (stinging nettle) and forests (black cottonwood) types cover more than 90 percent of this 186 acre island. A narrow high marsh habitat (primarily sedges) forms the island border and extends along slough channels. Riparian shrubs of willow and red alder provide a transition from the high marsh to the dominant forest habitat.

Soils are Columbia River alluvium with a very shallow organic layer. Topography is flat.

III.

Type of Ownerships	Number of Ownerships	Number of Residences	Acres
Private	1	0	186

IV. ADDITIONAL INFORMATION

The site has been identified by the Willapa Hills Audubon Society as an area of concern.

The State of Washington apparently plans to develop Hump Island for recreation.

The environmental and recreational potential of Fisher Island is low. There is some waterfowl hunting that does occur from the island.

There are no known historical or archeological resources on the island. Additional information on the site is available from the U.S. Fish and Wildlife Service, Olympia, Washington.

KELLOGG ISLAND

I. STATE: Washington COUNTY: King ACRES: 14

LEGAL DESCRIPTION: T24N, R4E, Sec. 19

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

The island is a relict tract of undeveloped wildlife habitat located in a highly industrialized area. The area is used by a variety of migratory birds. It is the only known nesting site for gadwall in western Washington. Other nesting species include spotted sandpiper, Canada goose, California quail, red-winged blackbird, and northern oriole. Wintering and migrant waterfowl also use the island.

One of the best salt marshes in the Seattle-King County area borders the island.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

The island is located in an industrial area and is zoned industrial. Plans for development of the island has begun pending results of an environmental impact statement now being prepared.

Log rafting on the island shoreline is also a threat to its importance to wildlife.

C. ECOSYSTEM DESCRIPTION

The island is located in the Duwamish Waterway. Both have been greatly altered by excavation and filling. Original geology and topography of the island has been greatly altered. Elevations range up to 25 feet above sea level.

Salt marsh fringes the island on the north and east sides. Sedges, rushes, spike rush, and salt grass are the dominate plants in this habitat.

On the higher parts of the island are red alder and willow. The predominant understory is blackberry.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Public	1	0	14

IV. ADDITIONAL INFORMATION

The island has been identified by the Seattle Audubon Society and the Duwamish Waterway Boat Owners Association as an area of concern.

Additional information on the island is available in "Colonial nesting sea and wading bird use of estuarine islands in the Pacific Northwest by Peter, Richter, Manuwal, and Herman to be published by the U.S. Army Corps of Engineers.

Wildlife observation, research, and environmental education would be compatible uses of the island. High densities of nesting birds would preclude some activities during the nesting season.

An archeological site on the mainland adjacent the island was discovered in 1977. There is the possibility of sites on the island as well.

UPPER ESQUATZEL COULEE

I. STATE: Washington COUNTY: Franklin ACRES: Unknown

LEGAL DESCRIPTION: T13N, R31E

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

The Coulee is an outstanding nesting area for birds of prey in eastern Washington. One known pair of prairie falcons and several pairs of ferruginous hawks, barn owls, great horned owls, and kestrels nest in the scabland cliffs of the Coulee. Other species of interest are the Ord's kangaroo rat and the spadefoot toad, both of which occur on the State Department of Game's list of species of concern in Washington.

B. DEGREE OF PROTECTION/THREAT OF DESTRUCTION

The new Second Bacon Siphon, associated with the Water and Power Resources Service, will bring new irrigation water and agricultural development to this area. Waste return water from the project will eventually enter the Coulee. Greatest impacts will be disturbance to nesting raptors and inundation of coulee bottoms.

The Water and Power Resources Service (WPRS) and the Game Department are evaluating the Coulee as a potential site to be set aside for fish, wildlife, and associated recreational uses. Management could minimize impacts and even enhance the overall area for wildlife.

C. ECOSYSTEM DESCRIPTION

The Coulee is a typical channelized basalt scabland of the Columbia Basin. Topography is undulating hills and deeply cut channels with sheer canyon faces. Vegetation is primarily sagebrush, rabbitbrush, cheatgrass, and associated forbs. Precipitation is usually less than 12-15 inches per year.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Private	2	1	Unknown

IV. ADDITIONAL INFORMATION

The Seattle Audubon Society and the Department of Game are aware of the area's value to wildlife. The area is being considered as one of several sites in the area to be purchases by WPRS and set aside for wildlife purposes.

THORNDYKE MARSH

I. STATE: Washington COUNTY: Jefferson ACRES: 40

LEGAL DESCRIPTION: T27N, R1W

II. REASONS FOR UNIQUENESS OR NATIONAL SIGNIFICANCE

A. WILDLIFE SPECIES, HABITAT AND SIGNIFICANT ECOSYSTEM VALUES

Thorndyke Bay combines saline, brackish, and fresh water marshes within relatively few acres, an unusual occurrence in any area. The wide range of salinity and the high plant species diversity support over 55 species of birds, as well as muskrat, beaver, mink, raccoon, river otter and blacktail deer. The area is extensively used by waterfowl and supports a rich, offshore complex of commercially harvestible fish and shellfish. The area represents one of the fast disappearing coastal marshes on the West Coast.

B. DEGREE OF PROTECTION THREAT OF DESTRUCTION

This largely undeveloped area lies within a pristine watershed on the northern Olympic Peninsula. The area can probably be maintained with the present logging pattern, but the timber company which owns most of the watershed and the marsh has plans to subdivide the drainage for 3000 homes. Even if the marsh itself is not developed, the quality of water from the drainage area would deteriorate, and higher sediment loads could fill in the marsh. Changes in the logging pattern could also present the same water quality problems.

C. ECOSYSTEM DESCRIPTION

Thorndyke Marsh, which lies along northern Hood Canal on the Olympic Peninsula, developed behind a barrier beach which is breached by Thorndyke Creek. The marsh receives a supply of fresh water from the creek and salt water from tidal action through the breach. These sources of water, plus the protected location, provide for high species diversity within a relatively small area. Salt marsh species include saltgrass and pickle-weed; fresh-water species include cattail and softstem bulrush. The surrounding uplands are forested.

III. OWNERSHIP INFORMATION

Type of Ownership	Number of Ownerships	Number of Residences	Acres
Private	1	0	40

IV. ADDITIONAL INFORMATION

Additional information on Thorndyke Marsh may be obtained from The Nature Conservancy (Seattle and Olympia), and Washington Department of Game.

UNRANKED SITES

Alta Lake Coulee

This site represents a unique glacial river channel with sheer canyon walls and is located in Chelan County. There are five known golden eagle nest sites in the Coulee, an unusual concentration for Washington. Ownership of the 1,200 acre site is primarily federal (Forest Service), with some private ownership (200 acres). Threats include increased recreational pressure and nest disturbance from the nearby recreational development at Alta Lake.

Barney Lake

The 70 acre lake winters up to 150 trumpeter swans and is used extensively by wintering waterfowl, especially canvasbacks. The site is privately owned and located in Skagit County near the Skagit River. The area has been identified and is being considered by the Game Department for possible acquisition.

Camp Pond

Camp Pond is a small glacial lake in Kitsap County with diverse shoreline and woodland habitats. An oak-prairie community on the site is unique to the area. Many woodland passerine birds, some waterfowl and marsh birds and mammals such as coyote, fox, beaver, and mule deer, use the area. The major threat to the area is uncontrolled public use and logging.

Carnation Marsh

This area is located one mile south of Carnation, Washington (Section 20, 29, 32, T25N, R7E) in King County. The marsh contains typical freshwater marsh vegetation and the surrounding area supports many large Sitka spruce which is unusual for the area. The marsh is important habitat for many species including wood ducks, American bitterns, and beaver. A pair of osprey nest in the vicinity. Ownership is private and the major threat is development.

Coal Creek Slough

The slough is located on the Columbia River and is one of the last remaining wetlands associated with the river in Cowlitz County. Ownership is public and the major threat is diking and the attendant industrial and agricultural development of the site. Wildlife diversity for the area is high. The site has been identified by the Willapa Hills Audubon Society as an area of special concern.

Cranberry Bog

Located near Yellow Lake in King County, this site represents a unique assemblage of plant species in an undisturbed setting. As such, it adds to the diversity of wildlife habitats in an area adjacent to a large metropolitan area (Seattle). The possibility of endangered and threatened plant species occurring in the bog is high. Threats include drainage and development of the bog and the surrounding forested areas. The site has been identified by the Seattle Audubon Society, Nature Conservancy, and members of the University of Washington faculty as a site of concern.

Cusick Meadow

The site, located in Pend Orielle County, is an excellent example of wet meadow habitat covering 300-400 acres of private land. The area is reported to be the most significant nesting habitat for bobolink in the state. Present threats to the site, besides early haying of meadows, appear minimal.

East Farms

East Farms is located on the Idaho border in Spokane County and is an excellent example of boulder strewn glacial outwash prairie grasslands. It is the only known breeding area for upland plovers in Washington. Threats include residential development, overgrazing, and power line transmission right-of-ways. Ownership status is unknown. The site has been identified by the Tahoma Audubon Society as an area of concern.

Elk River Estuary

This privately owned and undisturbed estuary is located in the southern portion of Grays Harbor in Grays Harbor Bay. The site is used extensively by waterfowl, shorebirds, and raptors and is an important area of primary productivity for Grays Harbor. Threats include filling and development.

Goat Ranch Pond

Goat Ranch Pond is an undisturbed pond and freshwater marsh located in Kitsap County. Many plant and animal species are represented. The area is excellent ring-necked duck habitat. The Washington Department of Natural Resources administers the land. Threats to the site include logging.

Great Blue Heron Marsh

This 20 acre site is a freshwater wetland located in the Green River Valley near Auburn, Washington. The area contains the only heron rookery in the valley (20 pairs). Eighty-six species of birds are known to use the area. Ownership includes both state and private lands.

Threats include development and loss of the rookery to woodcutting. The site has been identified by the Rainier Audubon Society, Nature Conservancy, and the Washington Department of Game as an area of concern.

Green River Bottoms

Located in urbanized King County, this 87 acre site south of Renton on the Green River represents an excellent example of climax deciduous riparian woodlot. Primary threat to the site is industrial development. Ownership is corporate (railroad).

Howell Lake

Howell Lake, located in Mason County, is a small undeveloped glacial lake with an associated sphagnum bog. As such, it represents a diverse "island" of wildlife habitat. Ownership is public (Department of Natural Resources). Threats are minimal.

Ika Island

The island is located at the mouth of the Skagit River and covers 86 acres of rocky forest upland and 75 acres of tidelands. The site has a great blue heron rookery, nesting bald eagles, and is used extensively by feeding waterfowl. Threats to the integrity of the site appear minimal at this time. The area is being considered by the Washington Department of Game for acquisition.

Kent Lagoons

The site is a series of ponds in the Green River Valley used extensively by waterfowl and marsh birds. The five ponds cover 60 acres. Threats at this time appear minimal. The area has been identified by the City of Kent, Rainier Audubon Society, and the Nature Conservancy as an area of concern.

Long Island

Long Island is a 58 acre privately owned site located off the south end of Lopez Island in San Juan County. The island supports possibly the highest known nesting concentration of black oystercatchers (state listed species of concern) in the Pacific Northwest. A glaucous-winged gull colony is located on the island. The island is virtually undisturbed and contains a small virgin forest of mixed conifers and hardwoods, native grasslands, and the occurrence of an uncommon brittle cactus. The surrounding intertidal area is exceptionally rich in marine life. Suitability is high for scientific study, but low for recreation. The primary threat to the site is development, contingent upon finding suitable freshwater sources.

Point Disney

Point Disney is located on Waldron Island, San Juan County. The 175 acre privately owned site includes open woodland oak communities, mixed conifer forest, 400 foot shale cliffs, rock outcroppings, and the surrounding intertidal zone. The area has three bald eagle nests (1 active pair), nesting cormorants on the cliffs, and was once the site of a peregrine falcon aerie. Avifauna is diverse including many pelagic species. Harbor seals frequent the area. The potential threats include homesite development, logging, and recreational activities. There is only one ownership involved and that is private.

Rocky Ford Creek

This site is a unique spring-fed creek approximately seven miles in length which empties into Moses Lakes in Grant County. There is the possibility of endemic fish and other aquatic life forms, but data is not available for evaluation. Ownership is private. Threats are unknown.

Samish Island Heron Rookery

Located on Samish Island in Skagit County, this site is one of the largest great blue heron rookeries in northern Puget Sound. The site is threatened by encroachment from land development, logging and woodcutting. The site has been identified by the Washington Department of Game as an area for acquisition.

Seaton Canyon

Located in Lincoln County, this site represents probably the best example of the shrub-steppe community dominated by Artemisia tripartita/ Festuca idahoenis. The site is also habitat for remnant populations of sharp-tailed grouse, a state-listed species of concern. Ownership and threat status is unknown.

Shoalwater (Tokeland) Marsh

The site is an excellent example of salt marsh and adjacent tidal mudflats. Located near the mouth of the Willapa Bay estuary in Pacific County, the site is used extensively by shorebirds, marsh birds, and waterfowl. The marsh is in private and tribal ownership and the major threat is from shoreline development.

Springer Lake

The site includes an undeveloped glaciated lake and an excellent example of a western Washington sphagnum bog. Plant and animal diversity is great. Major threats include logging and development of the area. Ownership is private and it is located in Thurston County, an area of rapid suburban development.

Wier Prairie

Wier Prairie is located in Pierce County on Department of Defense lands. The area is an excellent example of unmounded grasslands ("prairie") and as such is unique in western Washington. The primary threat is from military maneuvers with vehicles.

Yellow Lake

Yellow Lake is the last undeveloped glacier-formed lake in King County (Seattle metropolitan area). The lake is an island of wildlife habitat used by many waterfowl, marsh birds, and associated species. Within the immediate vicinity are the Cranberry Bog and Carnation Marsh; both identified as areas of special concern. The major threat to the lake is development for homesites. Ownership is private. The site has been identified by the Seattle Audubon Society and the Nature Conservancy as an area of concern.

TABLE 2

STATE	RANK	NAME	ECOLOGICAL SIGNIFICANCE (WILDLIFE, BOTANICAL, & ECOSYSTEM VALUES)	THREAT	PROTECTION	ACRES
WA	1	Lower Samish/ Padilla Bays	A large estuarine ecosystem which represents a major proportion of the remaining wintering/migrating habitat for waterfowl, shorebirds, and raptors in Washington State. The largest known population of wintering peregrine falcons (federally endangered) occurs here and the site contains significant numbers of bald eagles (federally threatened). One-third of the Pacific Flyway population of brant are noted here as well as 11 species of wintering raptors (including merlin and snowy owls). Very high avian diversity with over 200 species represented and high concentrations of wintering waterfowl/shorebirds.	Threatened by planned marina complex and secondary threats from water motorcycles and recreational boating.	The wildlife values found on the bays are for the most part not protected in Washington.	18,200
WA	2	Hanford Reach/ Columbia River	The site is a 51 mile stretch of the Columbia River which represents the last free flowing portion of the river in the United States. The reach is the last natural salmonid spawning area on the Columbia River and supports up to 30,000 spawning fall chinook salmon and 10,000 steelhead. Up to 15 bald eagles winter in the area as well as 50,000 ducks (primarily mallards) and 6,000 Canada geese. Raptor populations are diverse (21 species) including 10 species that nest in the area. Canada geese numbering up to 300 pairs nest on river islands. Nesting colonies of great blue heron, black-crowned night heron, ring-billed gull, and Forster's tern also occur in the reach. Two threatened plants (Smithsonian list) and two endemic mollusks inhabit the area.	The proposed Ben Franklin Dam would inundate most of the reach. Other threats include a navigation channel, power peaking and public disturbance.	The site is designated a National Environmental Research Park by Dept. of Energy but this would not preclude the Ben Franklin Project.	25,000+
WA	3	Protection Island	A relatively large island in the Puget Sound which supports large populations of colonial nesting seabirds. The island contains half the nesting rhinoceros auklets in Washington, six other nesting seabird species as well. A bald eagle (federally threatened) nest is found on the island and a large group of harbor seals occupy an island point.	Imminent threat from housing development and secondary from human intrusion into the seabird colonies	The seabird colonies found on the island have some protection elsewhere but the extent is unknown.	346
WA	4	Sequim Bay	This large, relatively undeveloped bay is of major importance to migratory waterfowl, shorebirds, marshbirds, and seabirds. Peregrine falcons and bald eagles use the area during winter months. Shellfish are abundant. The bay is an important nursery and food production area for many species of fish and other marine life forms.	Threatened by a proposed marina complex and shoreline development.	Present statues and regulations have been only partially successful in protecting such sites from development.	3,325
WA	5	McNeil Island	McNeil Island contains the last population of harbor seals in south Puget Sound. The island is used both for pupping and hauling out. An active bald eagle nest is located on adjacent Gertrude Island and a rookery (74 pairs) of great blue herons is located on McNeil Island. Over 10,000 waterfowl winter in the immediate area. The intertidal flora and fauna is diverse and abundant.	McNeil Island will be placed on an excess property list in the immediate future. Land development pressure is great.	The islands are presently in federal ownership (Dept. of Justice) but a change in ownership could jeopardize protected status.	4,400

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